Transhipment & Transportation

Governor's Vision 2001
Strategic Plan

Transshipment
and
Transportation

Executive Summary

Transshipment and Transportation

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Transshipment and Transportation

Executive Summary

Guam's geographic location makes it dependent upon its air and sea transportation industries. The development of new transportation and transshipment industries, as well as the expansion of present industries, are required for Guam's continued economic growth. They are also required to promote new economic growth. The Base Realignment and Closure Commission decisions of 1993 and 1995 provide Guam with unique opportunities to expand its economic base. The following are the overall strategies to expand Guam's air and sea transportation and transshipment industries. They are predomininately dependent upon Guam's ability to acquire and make effective use of land and resources being made available to the territory through the base closure and realignment process.

Air Transshipment and Transportation:

- Create an aircraft maintenance school: The establishment of an aircraft maintenance school at Tiyan will ensure Guam has the skilled labor pool required to attract airline companies. Coupled with the establishment of an aircraft maintenance base and aviation industry center, a new job base will be created.

- Create an airport industrial park: The availability of additional land for the creation of an airport related industrial park will further Guam's potential to create and expand its transportation and transshipment industries. It will for example, enable the creation of additional commercial and industrial warehouse space required to fuel economic growth. It will also enable Guam's potential to become a cargo hub for package express couriers to be pursued. Lastly, it will enable Guam to pursue numerous other air transportation and transshipment industries.

- Increase Tourist Arrivals: Increase tourist new arrivals and returns by removing U.S. and Guam customs obstacles that hinder their ability to expeditiously enter Guam.

Surface Transshipment and Transportion:

- Create a civilian ship repair facility: To prevent the loss of jobs while creating new jobs, a civilian ship repair facility will be established. This will enable Guam to compete for Naval ship repair contracts and contracts to repair U.S. built ships that are foreign owned.

- Obtain Apra Harbor federal assets: Securing the acquisition of federal lands and equipment through transfer or long term leases will be pursued in order to convince large and lucrative private sector enterprises to make investments on Guam.

- Increase Passenger Ship Arrivals: Expand the tourism industry and create additional employment opportunities through the development of a viable cruise ship industry. Provide tourists with wharf frontage that is designed to accommodate people rather than cargo and promote the development of businesses that target cruise ship passengers.

- Expand container handling and transshipment facilities: The availability of additional land and commercial warehousing near Guam's commercial port will further Guam's potential to create and expand its transportation and transshipment industries. For example, Guam can become a transshipment hub for containerized cargo. Guam can also increase port calls by fishing fleets operating in its waters through expanded facilities designed to meet their needs. Lastly, valuable warehouse space in central Guam can be put to higher productive uses through the creation of warehousimg mear the commerial port.

Policy Recommendations

Strategic Planning Objectives

Task Force: TRANSPORTATION AND TRANSSHIPMENT 2001 STRATEGIC PLANNING TASK FORCE

Objective 1: To Establish Aviation Related Activities

Key Results/Action Items	Time Table	Resources Needed	Accountability	Feedback Mechanism
1.1 Identify and evaluate all potential multiple uses for aviation related activities	June 1996	N/A	Guam Airport Authority (GAA)	Completed GAA Masterplan
1.2 Integrate with existing economic development programs and activities	December 1996	N/A	Guam Airport Authority (GAA)	Legislative initiatives
1.3 Work with Navy in identifying actual site for establishing aviation related activities for immediate reuse	June 1996	N/A	Guam Airport Authority (GAA)	GAA masterplan
1.4 Develop and implement marketing plan to target businesses and industries and expand existing facilities for aviation activities	December 1996	N/A	Guam Airport Authority (GAA) GEDA	Compiled listing of companies
1.5 Work with Airlines in establishing proper procedures, requirements and guidelines for the development of an aircraft maintenance School	December 1996	N/A	Guam Airport Authority (GAA)	Creation of Guam Institute of Aviation
1.6 Re-engineering of Airport Maintenance and Operations functions	December 1996	N/A	Guam Airport Authority (GAA)	Establishing airport service contracts.

Task Force: TRANSPORTATION AND TRANSSHIPMENT 2001 STRATEGIC PLANNING TASK FORCE

Objective 2: To Designate Guam as a Pre-Clearance Area for U.S. Customs

Key Results/Action Items	Time Table	Resources Needed	Accountability	Feedback Mechanism
2.1 Establish working dialogue with U.S. Customs Service to address issues and opposition	June 1996	N/A	Governor's Office Task Force	Report on U.S. Customs analysis and response
2.2 Determine and compile Guam's existing passenger and cargo volume and projected future volume	June 1996	80 man hours	Guam Customs Guam Airport Port Authority	Passenger and cargo volume data compiled
2.3 Determine federal requirements for pre-clearance designation	June 1996	N/A	Task Force	Federal requirements identified and addressed
2.4 Work with Airlines to implement the U.S. Customs Advance Passenger Information System (APIS)	December 1996	N/A	Guam Airport Authority (GAA)	Advance passenger clearance
2.5 Formulate a written proposal and request for U.S. Customs Service that should include a Guam profile, passenger and cargo volume information, manpower assessment, facilities available under BRAC closing as selling point for pre-clearance designation	December 1996	N/A	Port Authority Guam Airport GEDA	Formal proposal and request submitted for consideration

Task Force: TRANSPORTATION AND TRANSSHIPMENT 2001 STRATEGIC PLANNING TASK FORCE

Objective 3: Development of a Passenger Cruise Terminal and Related Facilities

Key Results/Action Items	Time Table	Resources Needed	Accountability	Feedback Mechanism
3.1 Identify and determine suitable location for a passenger cruise facility	June 1996	N/A	Port Authority	Suitable and accessible location
3.2 Design specifications for a cruise terminal and other related facilities	December 1996	N/A	Port Authority	Specification plans
3.3 Embark upon major capital improvement and reconstruction of wharf and infrastructure needs	December 1997	$5,000,000	Port Authority	Improved infrastructure capabilties and facilities
3.4 Develop marketing and strategic plan for implementation to include types of vendors, cruiselines and related activities and facilities	December 1997	$250,000	Port Authority GVB GEDA	Final Marketing Plan

Task Force: TRANSPORTATION AND TRANSSHIPMENT 2001 STRATEGIC PLANNING TASK FORCE

Objective 4: Establish Guam as a Trans-shipping and Air Cargo Hub in the Western Pacific

Key Results/Action Items	Time Table	Resources Needed	Accountability	Feedback Mechanism
4.1 Establish working dialogue to address fishing policy issues and obstacles with U.S. Immigrations and FSM Government	December 1996	N/A	Governor's Office	Lifting of policies that hinder Guam's growth in the trans-shipping and fishing industry
4.2 Identify and evaluate private industry interest in shipping and air cargo opportunities	December 1996	N/A	Port Authority Guam Airport	Report of Evaluation
4.3 Determine physical capabilities and associated infrastructure needs for construction and improvements	December 1996	$50,000	Port Authority Guam Airport	Report of Findings
4.4 Construction improvements to over 75% of the piers, wharfs and docking capabilities	December 1997	$3,000,000	Port Authority	Upgraded infrastructure
4.5 Improvements to warehouses and container storage facilities	December 1997	N/A	Guam Airport Port Authority	Upgraded and improved warehouses and container storage facilities
4.6 Develop target marketing and financial programs to include federal and local resources as incentives	December 1997	$50,000	GEDA Port Authority Guam Airport	Workable Marketing and financial plan

Task Force: TRANSPORTATION AND TRANSSHIPMENT 2001 STRATEGIC PLANNING TASK FORCE

Objective 5: Privatization of the Ship Repair Facility and Fleet Industrial Warehouses

Key Results/Action Items	Time Table	Resources Needed	Accountability	Feedback Mechanism
5.1 Prepare an inventory of all real estate and personal property assets	March 1996	N/A	GEDA (LRA)	Inventory of real estate completed. Navy's inventory of equipment is pending
5.2 Hire Business Consultant to develop Reuse and Business Engineering Plan	March 1996	N/A	GEDA (LRA)	GMP Associates (including off-island Reuse legal and Consulting firms) have been hired.
5.3 Development of a Business Plan for SRF and FISC reuse	April 1996	N/A	GEDA (LRA)	Business Plan expected to be completed in April 1996
5.4 Development of a Reuse Plan	June 1996	N/A	GEDA (LRA)	Interim Reuse Plan is expected to be completed inJune 1996
5.5 Identify and establish a list of private companies engaged in ship and industrial repair work	June 1996	N/A	GEDA (LRA)	A listing of companies expressing interest in facilities has been compiled.

Task Force: TRANSPORTATION AND TRANSSHIPMENT 2001 STRATEGIC PLANNING TASK FORCE

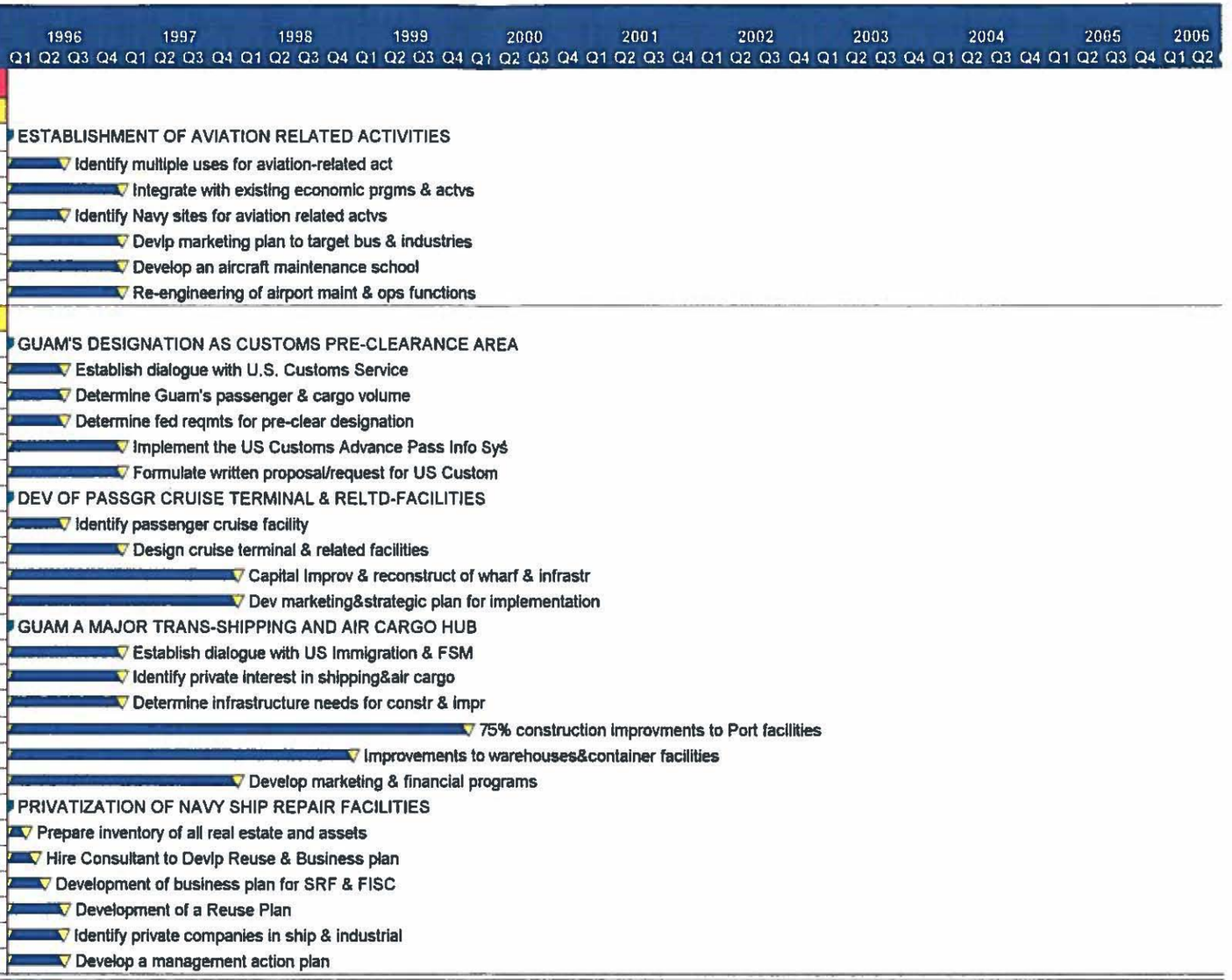
Objective 5: Privatization of the Ship Repair Facility and Fleet Industrial Warehouses

Key Results/Action Items	Time Table	Resources Needed	Accountability	Feedback Mechanism
5.6 Develop a management action plan for the reuse and privatization of SRF and FISC on a parallel approach basis	June 1996	N/A	GEDA (LRA)	A draft Management Action Plan has been developed.
5.7 Establish a Memorandum of Agreement between DoD (Navy) and LRA for receipt, response and evaluation of any solicited and unsolicited proposals for privatization	May 1996	N/A	GEDA (LRA)	Adopted MOA
5.8 Evaluate and implement use of caretaker status to allow GovGuam control over facilities and equipment to lease for civilian use prior to property disposal	December 1996	N/A	GEDA (LRA)	Interim Reuse
5.9 Identify, remove and ameliorate any environmental obstacles to reuse or privatization	December 1997	N/A	GEDA (LRA) Guam EPA	Environmentally safe and clean facilities and properties

Strategic Planning Objectives Matrix - Task Force

VISION 2001

Description	Early Start	Early Finish
TRANSPORTATION & TRANSHIPMENT		
Barrigada		
ESTABLISHMENT OF AVIATION RELATED ACTIVITIES	01JAN96	01JAN96
Identify multiple uses for aviation-related act	02JAN96 A	30JUN96 A
Integrate with existing economic prgms & actvs	02JAN96 A	31DEC96 A
Identify Navy sites for aviation related actvs	02JAN96 A	30JUN96 A
Devlp marketing plan to target bus & industries	02JAN96 A	31DEC96 A
Develop an aircraft maintenance school	02JAN96 A	31DEC96 A
Re-engineering of airport maint & ops functions	02JAN96 A	31DEC96 A
Piti		
GUAM'S DESIGNATION AS CUSTOMS PRE-CLEARANCE AREA	01JAN96	01JAN96
Establish dialogue with U.S. Customs Service	02JAN96 A	30JUN96 A
Determine Guam's passenger & cargo volume	02JAN96 A	30JUN96 A
Determine fed reqmts for pre-clear designation	02JAN96 A	30JUN96 A
Implement the US Customs Advance Pass Info Sys	02JAN96 A	31DEC96 A
Formulate written proposal/request for US Custom	02JAN96 A	31DEC96 A
DEV OF PASSGR CRUISE TERMINAL & RELTD-FACILITIES	01JAN96	01JAN96
Identify passenger cruise facility	02JAN96 A	30JUN96 A
Design cruise terminal & related facilities	02JAN96 A	31DEC96 A
Capital improv & reconstruct of wharf & infrastr	02JAN96 A	31DEC97 A
Dev marketing&strategic plan for implementation	02JAN96 A	31DEC97 A
GUAM A MAJOR TRANS-SHIPPING AND AIR CARGO HUB	01JAN96	01JAN96
Establish dialogue with US Immigration & FSM	02JAN96 A	31DEC96 A
Identify private interest in shipping&air cargo	02JAN96 A	30DEC96 A
Determine infrastructure needs for constr & impr	02JAN96 A	31DEC96 A
75% construction improvments to Port facilities	02JAN96 A	31DEC99 A
Improvements to warehouses&container facilities	02JAN96 A	31DEC98 A
Develop marketing & financial programs	02JAN96 A	31DEC97 A
PRIVATIZATION OF NAVY SHIP REPAIR FACILITIES	01JAN96	01JAN96
Prepare inventory of all real estate and assets	02JAN96 A	01MAR96 A
Hire Consultant to Devlp Reuse & Business plan	02JAN96 A	31MAR96 A
Development of business plan for SRF & FISC	02JAN96 A	30APR96 A
Development of a Reuse Plan	02JAN96 A	30JUN96 A
Identify private companies in ship & industrial	02JAN96 A	28JUN96 A
Develop a management action plan	02JAN96 A	30JUN96 A



VISION 2001

Description	Early Start	Early Finish
Establish a MOA between Navy & GEDA	02JAN96 A	31MAY96 A
Evaluate & implement use of a caretaker status	02JAN96 A	31DEC96 A
Identify & remove any environmental obstacles	02JAN96 A	31DEC97 A

Strategic Planning Objectives Matrix - Responsibility by Government Agency

VISION 2001
TRANSPORTATION & TRANSSHIPMENT

Description	Early Start	Early Finish
Guam Airport Authority		
Barrigada		
ESTABLISHMENT OF AVIATION RELATED ACTIVITIES	01JAN96	01JAN96
Identify multiple uses for aviation-related act	02JAN96 A	30JUN96 A
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Identify Navy sites for aviation related actvs	02JAN96 A	30JUN96 A
Devlp marketing plan to target bus & industries	02JAN96 A	31DEC96 A
Develop an aircraft maintenance school	02JAN96 A	31DEC96 A
Re-engineering of airport maint & ops functions	02JAN96 A	31DEC96 A
Guam Economic Development Authority		
Piti		
PRIVATIZATION OF NAVY SHIP REPAIR FACILITIES	01JAN96	01JAN96
Prepare inventory of all real estate and assets	02JAN96 A	01MAR96 A
Hire Consultant to Devlp Reuse & Business plan	02JAN96 A	31MAR96 A
Development of business plan for SRF & FISC	02JAN96 A	30APR96 A
Development of a Reuse Plan	02JAN96 A	30JUN96 A
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Develop a management action plan	02JAN96 A	30JUN96 A
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Evaluate & implement use of a caretaker status	02JAN96 A	31DEC96 A
Identify & remove any environmental obstacles	02JAN96 A	31DEC97 A
Port Authority of Guam		
Piti		
GUAM'S DESIGNATION AS CUSTOMS PRE-CLEARANCE	01JAN96	01JAN96
Establish dialogue with U.S. Customs Service	02JAN96 A	30JUN96 A
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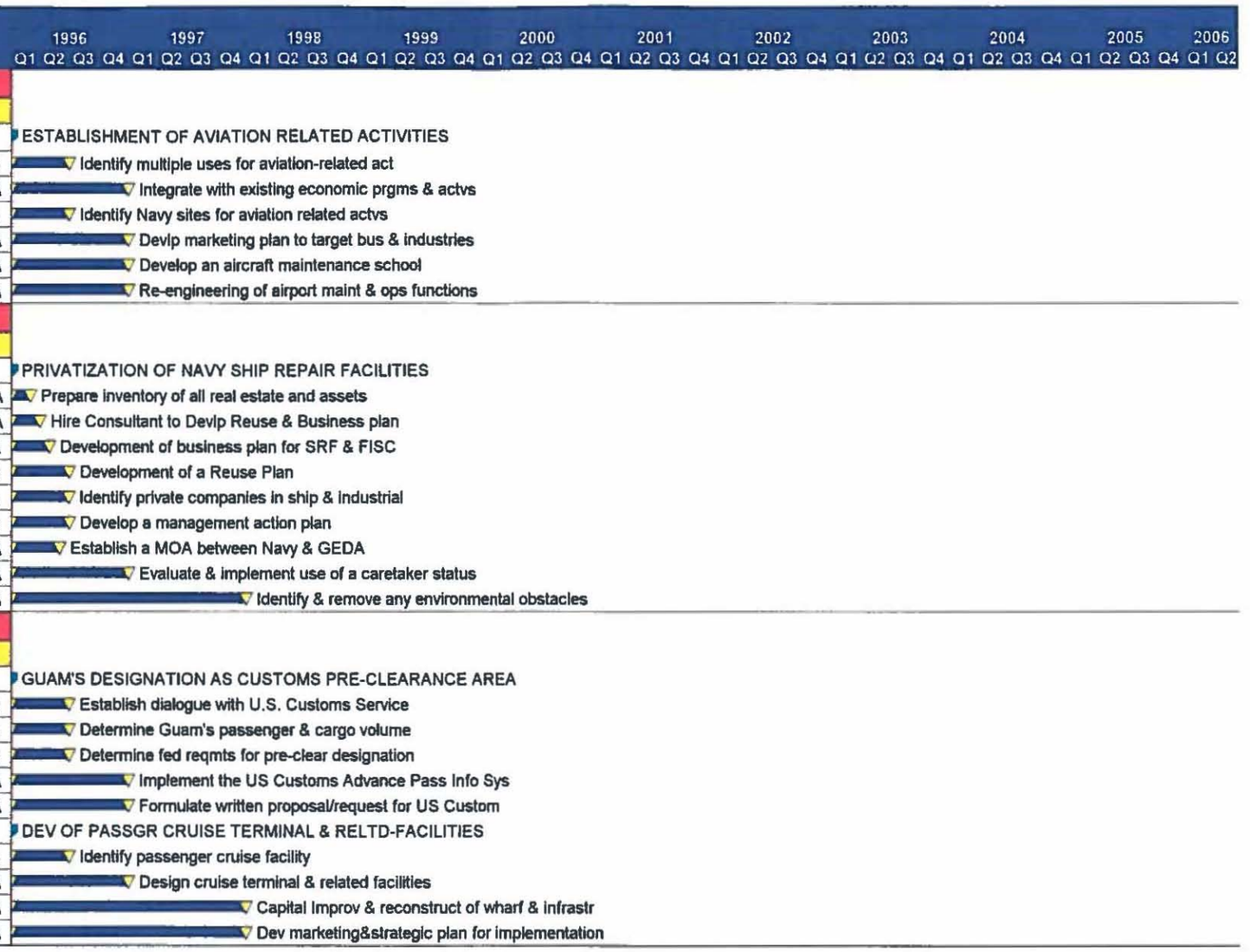

VISION 2001
TRANSPORTATION & TRANSSHIPMENT

Description	Early Start	Early Finish
GUAM A MAJOR TRANS-SHIPPING AND AIR CARGO HUB	01JAN96	01JAN96
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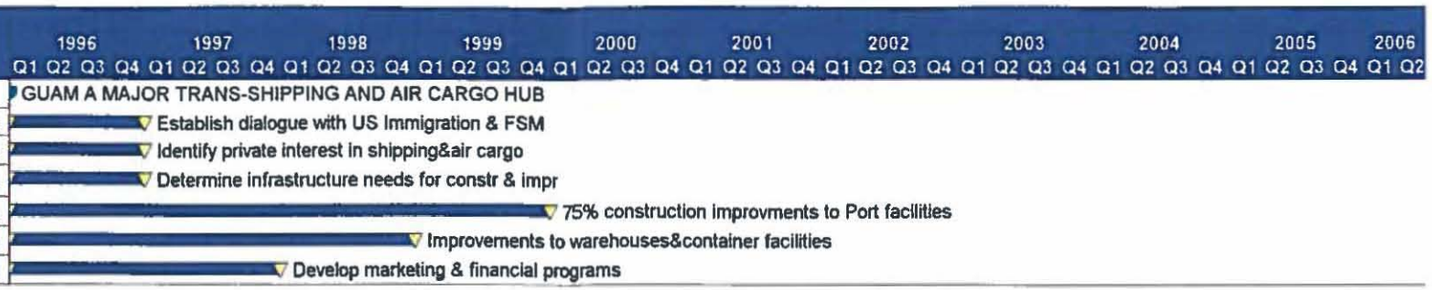

Technical References

NAS Base Reuse Master Plan December 22, 1995

Guam International Airport Master Plan April 12, 1995

Draft Business Reuse Plan Base Realignment and Closure (BRAC) 95 Guam September 30, 1996

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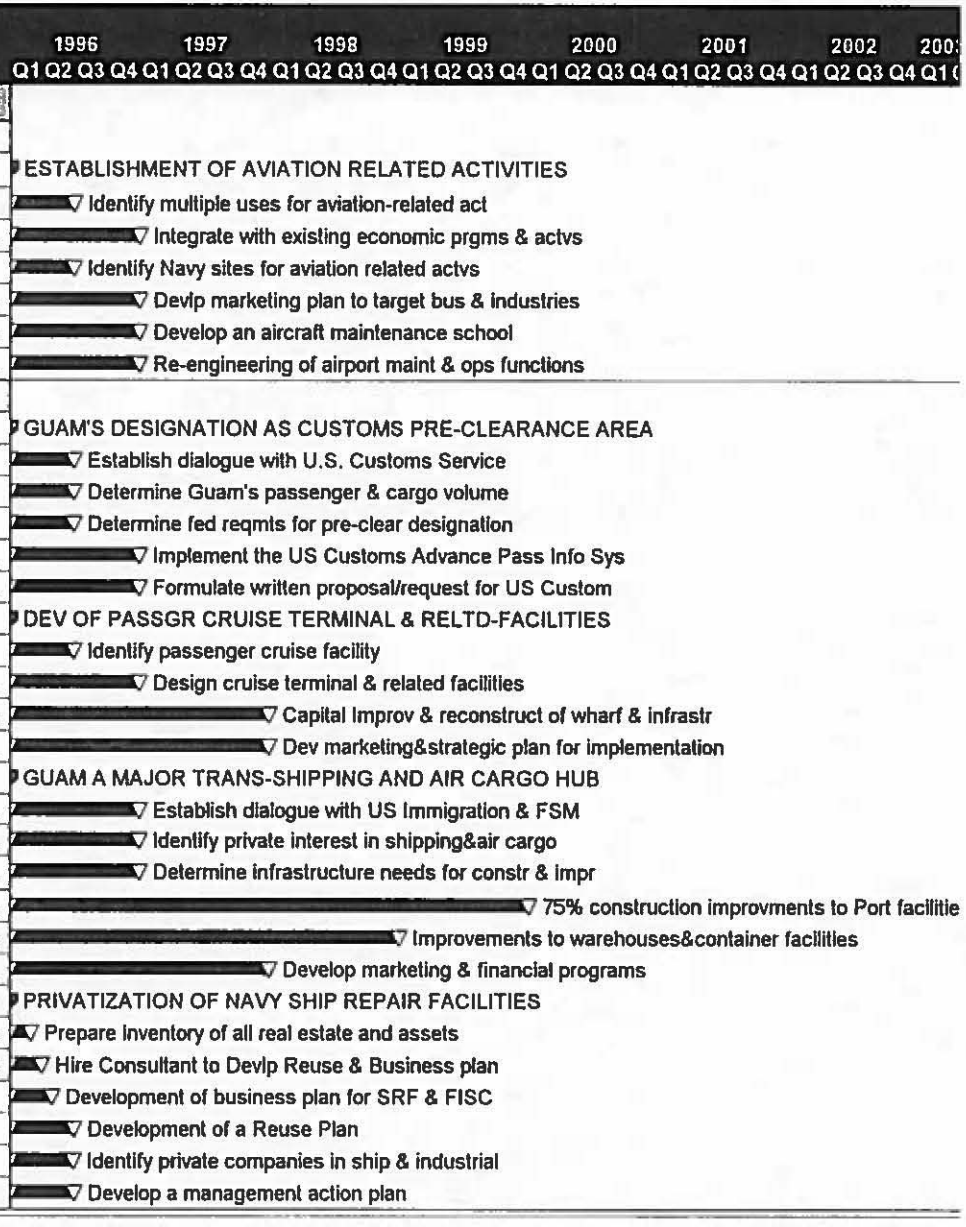

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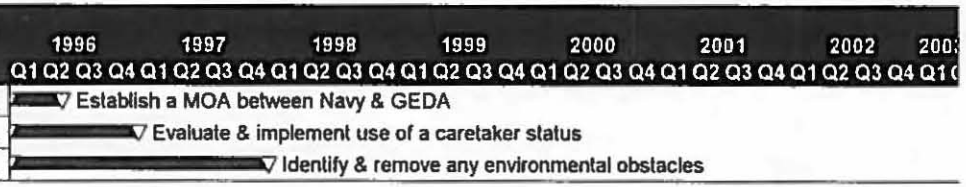

Draft Business Reuse Plan

Base Realignment and Closure (BRAC) 95
Guam

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Prepared for the
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GP
ASSOCIATES, INC.
Engineers/Architects

Executive Summary

Executive Summary

The 1995 Defense Base Closure and Realignment Commission approved four recommendations that directly affect facilities currently operated by the U.S. Navy in Apra Harbor. The four actions are the realignment of Naval Activities, Guam; the realignment of Public Works Center, Guam; the closure of Ship Repair Facility, Guam; and the disestablishment of the Fleet and Industrial Supply Center, Guam.

The combination of these recommendations eliminates the U.S. Navy's needs for many of their current facilities located in or adjacent to Apra Harbor. The recommendations, however, are not explicit in the identification of the ultimate disposition of many of the specific Apra Harbor facilities. Large number of potential job losses due to the closure and realignments makes early reuse of the former Navy facilities critical to sustain Guam's economy. Navy officials in Guam and in Washington, DC, have continued to state, in general terms, their interest in supporting Guam's economic growth through the transfer of property, facilities, and equipment. This Navy support includes the potential for the early transfer of some of the properties when interim reuses are available.

Economic Assessment and Market Demand

The return of facilities in Apra Harbor presents a unique opportunity for Guam to capitalize on developing it to support its needs for diversifying its economy and to expand the needs of its core industry—tourism. How successfully Guam exploits the circumstances depends largely on external market conditions, future revenue streams that such markets will generate, the degree of success Guam achieves in marketing itself, and whether Guam can integrate itself as an essential member of the increasingly important Pacific Basin economy.

Three general categories of market needs can be satisfied by the conversion of Apra Harbor from a military port into a dynamic, private-operated, marine-oriented facilities:

- Ship repair/industrial manufacturing
- Fishing industry needs
- Expansion and diversification of tourism infrastructures

With respect to ship repair, it is essential that Guam retains its core business of work for the U.S. federal government—specifically, the work the existing Navy SRF (Ship Repair

Facility) now performs for the Military Sealift Command. That workload represents approximately 180 manyears of work, almost one-half the theoretical market demand for ship repairs in Guam. Second, an aggressive marketing plan to secure work related to the Foreign Military Sales (FMS) Program, perhaps as part of a joint-financing arrangement with a Taiwanese (or other Asian) investor/ship repairer, needs to be pursued. That workload—which could range from 130 to 270 manyears of work—could be equal to or greater than the workload now offered by repairs to MSC vessels.

The appearance of a sizable commercial fishing activity in Apra Harbor is a relatively new phenomenon, having begun to attract tuna fishermen in the mid-1980s. By the late 1980s, however, Apra Harbor had become the home port to over 200 tuna vessels including both sashimi grade longliners and tuna for canning purse seiners. The presence of both longliners and purse seiners has created a demand for a range of services within Apra Harbor, including net repairs, some vessel maintenance, hydraulic repair services, warehousing, salt production, bait storage, ice production and supply, fuel, and provisioning.

Of Guam's two principal primary economic sectors—tourism and military—only tourism will expand over the next 5 to 10 years. Tourism is already larger than defense, and as tourism grows, so will the island's secondary industries. The combined GDP of Japan, China, Taiwan, Hong Kong, Korea, Australia, and New Zealand is $6.3 trillion. This group of nations represents a vast market with a population that exceeds 1.4 billion. Nearly 12 million Japanese travel overseas annually, and this number is likely to double in the next decade. Similar, or even larger gains in the demand for travel can be expected in the other industrial economies of Asia. To the extent that tourism is the Western Pacific's comparative advantage and high-saving and high-spending Asian tourists want to travel to places that offer the tourist services they seek, the two regions will benefit from each other's growth and prosperity.

How the primary benefits of tourism jobs, income, and taxes can be used to generate other sources of income—e.g., regional trade and distribution center, ship repair facility—to diversify Guam's economic base will be a key challenge in the near to middle term.

Employment Needs

Guam's economic boom of the 1980s that had been fueled by Japanese capital and tourist spending, resulted in peak private sector employment in 1992. Since then, private sector employment has dropped 7.3 percent. Public sector employment peaked in 1993 and has

since dropped 11.4 percent—federal employment dropping by 1,572, while territorial employment dropping by 967.

Guam is by far a services-oriented economy than a production-driven economy. Employment in manufacturing actually declined from 1,851 in 1989 to 1,750 in 1995, and constitutes only 2.7 percent of the total workforce of 65,130. Manufacturing, along with federal employment, are the only two employment sectors to have declined. Skilled labor, such as that currently employed at the SRF, are normally be engaged in the manufacturing industry. Successful privatization of the SRF and retention of a core repair workload for work on Military Sealift Command (MSC) ships will re-employ approximately 180 of the 326 workers estimated to be displaced, leaving 146. These remaining workers will all be re-employed if Guam is successful in retaining not only the MSC work, but also the promising Foreign Military Sales (FMS) workload. The latter is expected to require between 130 and 270 manyears of work, effectively eliminating worker displacement.

Wholesale employment, in 1995 representing about 3.3 percent of the total work force, rose from 1,691 in 1989 to 2,160 in 1995, a 28 percent gain. Since peaking in 1993 at 2,209 employees, it has dropped a minimal 2.2 percent. Functionally, the work of the FISC is wholesale in nature. These are skills which are readily adaptable to private industry, having little real difference between military work and civilian work. The employees are particularly suited for re-employment in the booming retail sector of Guam's economy, as well as in the wholesale and services sectors. Because Guam's economy is expected to be fueled principally by tourism and its supporting industries, retail sales, wholesale, and other services can be expected to grow at a healthy pace. Current discussions and negotiations for expansion of Guam's retail sales industry through the construction of a major "factory outlet" mall and new specialty restaurants such as the *Hard Rock Cafe* and *Planet Hollywood* are sure to generate increased employment opportunities that could readily absorb excess FISC workers.

Planning Criteria and Concepts

Conceptually, long-term uses for Apra Harbor can be evaluated based on its two distinct regions: Inner Apra Harbor and Outer Apra Harbor.

The Inner Apra Harbor area, with its shallow entrance channel—some portions of the entrance channel are between 33 and 45 feet MLLW—is currently limited to smaller class vessels that can successfully negotiate these shallow waters. Unless a costly and aggressive dredging program were to be initiated, the Inner Apra Harbor area will be limited to smaller ships such as cruise, cargo, or fishing vessels that are presently deployed in the region. Cargo such as liquid bulk with its deep draft vessels are not primary candidates

for Inner Harbor locations. These limitations, however, in no way diminish the vessel call values that the Inner Apra Harbor is capable of accommodating. In general terms, the Inner Harbor is suitable for the following functions:

- Fishery Facility
- Break-Bulk
- Warehousing
- Passenger/Cruise Facilities
- Local Excursion Facilities
- Containerized Cargo Terminals
- Light Industrial Manufacturing
- Conservation Area
- U.S. Navy
- U.S. Coast Guard

Outer Apra Harbor, with its deep entrance channel, represents a much greater potential for deep water berths—the average water depth in the Outer Apra Harbor and Middle Ground is over 100 feet. Some of the berths located within the Commercial Port, which are located along the northern shoreline of Outer Apra Harbor have fairly shallow water or underwater obstructions (coral heads at -22 feet below MLLW are present at Berth Foxtrot-6) and several of the wharf structures experienced extensive damage during the August 1993 earthquake. Despite some of the apparent draft restrictions at several of the wharves in Outer Apra Harbor, however, the opportunity to develop several deep water berths exists. The potential for deep water berths presents an opportunity for many more of the larger class cargo vessels to call on Guam. In addition, within the deep water areas of Outer Apra Harbor, there are four anchorages for commercial vessels and three that are reserved for the U.S. Navy. Except for U.S. Navy imposed restrictions to portions of the Harbor due to submarine activities and special explosive anchorage zones, the Outer Apra Harbor area is generally accessible to large cargo vessels. Potential long-term uses for Outer Apra Harbor is as follows:

- Liquid Bulk Terminals
- Dry Bulk Terminals
- Containerized Cargo Terminals
- Break-Bulk/Autos Facilities

- Transshipment Container Facilities
- Local Excursion Facilities
- Public Use
- Conservation

Perhaps the Ship Repair Facility and its surrounding area have the greatest reuse potential of all the BRAC properties. There are three likely uses for this area that is strategically located at the junction of the Inner and Outer Harbors:

- Ship Repair Facilities
- Containerized Cargo
- Break-Bulk

The planning process must consider a wide variety of legal and regulatory issues that impact the redevelopment effort. In broad terms, these provisions fall into one of the following categories:

- Shipping and Maritime Issues
- Guam-Specific and Potential Port Development Issues
- Environmental Issues; and
- Miscellaneous Proposed Defense Legislation

Once functional reuses limitations are determined and regulatory and/or statutory constraints have been identified, physical considerations must be clearly understood. The width of the Apra Harbor approach channel (the area dredged for access by deep draft ships) must be carefully sized to allow for ships well into the next century. The existing Inner Apra Harbor channel width is approximately 900 feet. However, the existing Outer Apra Harbor channel is narrower being approximately 400 feet wide. In order to provide maximum flexibility in accessing new, future developments in either Inner or Outer Apra Harbors, some additional dredging may be required.

To accommodate today's larger container vessels, the recommended access channel should be at least 50 feet below MLLW (mean lower low water). But, it may not necessarily need to be widened in order to accommodate two-way traffic. In the Outer Harbor, the open channel should be 416 to 525 feet wide to accommodate future types of vessels. An adequate turning basin must also be designed.

Executive Summary

Ten facility (terminal) modules were developed to evaluate the basic land and infrastructure requirements for the redevelopment of Apra Harbor. Each module was flexibly designed so that it can be adjusted to meet a variety of site configurations. The ten facility modules are:

- Container Module—Wheeled
- Container Module—Rubber-Tired Gantry (RTG)/Wheeled
- Container Module—Forklift Truck (FLT)/Wheeled
- Transshipment Module—RTG and Wheeled
- Transshipment Module—FLT and Wheeled
- General Cargo-Break Bulk/Neo Bulk Module
- Liquid Bulk Petroleum Module
- Passenger/Cruise (Home port) Module
- Excursion Cruise Module
- Fishery Module

Each of these modules are associated with average throughput characteristics based on typical industry standards. The modules were used in this plan in the following manner:

- Each candidate development area was analyzed to gauge the feasibility of fitting that module's function into the available area.

- The modules were also used to determine the benefits and costs associated with using existing buildings and infrastructures at each site.

- Although in some areas the modules did not precisely fit, they could be expected to operate effectively since the modules are flexible enough to permit a variety of wharf and site configurations. It was also possible to analyze mixed use facilities by combining two or more modules.

- The modules were used as guidelines for preparing cost ranges according to the environment at each site, in addition to the long term goals and needs for the port.

Executive Summary

Reuse Alternatives

In evaluating possible interim reuse options, heavy emphasis was placed on the compatibility of the short-term reuse alternatives in light of the more permanent, long-term plan. Prudent planning dictates that it makes little sense to allow a specific short-term use if it is known that its conversion to meet long-range planning needs requires significant rework. Ideally, long-term reuses should drive the decision making process for interim reuse.

Conceptual alternatives were developed in assessing optimum short-term reuses. These options were then evaluated in terms of (1) their impact, if any, on the long-term plans for the area, (2) short-term benefits, (3) detriments of short-term use, (4) the adequacy of existing facilities and equipment, and (5) the adequacy of existing utilities and infrastructures. Once each option had been assessed, they were compared against each other on relative merits and detriments. Finally, a recommended plan was developed based on these assessments.

NAVACTS Realignment.

Victor Wharf. Using the facility modules discussed earlier, Victor wharf appears suitable for five different long term functional reuses—Fishery Facility, Containerized Cargo, Break Bulk, Passenger Cruise, and Warehouse operations. A sixth use is by the U.S. Coast Guard. Although the Coast Guard will remain in its present location—in the approximate center of the wharf area—other functions can be readily performed without interfering with or being interfered by Coast Guard.

Interim lease(s) should be secured for substantial portions of Victor Wharf as (1) the facility is not only available, but continuing uses in the area can be accommodated in a feasible reuse plan, (2) necessary repairs to the facilities and infrastructures needed for short-term commercial uses have been substantially completed, and (3) prospects for immediate commercial use as a relocated fisheries facility, passenger/cruise facilities, local excursion facilities, and break-bulk terminals exist.

The short-term plan is expected to be executed in two phases in order to satisfy relocation considerations of existing Navy functions.

Phase I. In the first phase, the Government of Guam leases the southern portion of Victor Wharf and develops its fishery facilities. Access to the south Victor Wharf fishery area is through a single gate at Marine Drive. The area is separated from adjacent Navy properties by the new GovGuam-constructed perimeter fencing.

Phase II. Phase II completes the leasing of the northern portion Victor Wharf and Uniform Wharf. Execution timing of this phase is dictated by Navy needs to construct replacement facilities for the SEALS and the need to repair Uniform Wharf of the damages caused by the August 1993 earthquake. The northern and southern Victor Wharf areas of the Government of Guam are split by the Coast Guard Station, but adequate alternate access routes are provided to GovGuam. The Navy, prior to completion of this phase, constructs a new fence line and entry station as it consolidates its needs farther into the naval base.

Drum Lot at Polaris Point. The draft land use plan for Guam, "I Tano'ta," has designated two zones for the Drum Lot area at Polaris Point for its long term use. The abandoned hardstand area is zoned for Industrial/Port Facilities, while the environmentally sensitive wetlands, river, and shoreline along the northern boundary are zoned Conservation/Preservation. Both designations are appropriate for the site conditions.

In the short term, portions not set aside as conservation/preservation can be used for one of three possible uses: (1) open storage area, (2) open space recreation, and/or (3) a light industrial park. The recommended short term reuse is to initiate the industrial park concept by securing immediate interim lease(s) from the Navy. Prospective tenants would be engaged in light manufacturing and warehousing. To date, the Local Reuse Authority (LRA) has reviewed expressions of interest from businesses involved in (1) warehousing—both dry and cold storage, (2) furniture production, and (3) fabrication of plastic home building products. Generally, tenants are expected to construct one- to two-story prefabricated buildings on two acre lots. Building size would vary from twenty to forty thousand square feet. Since retail and wholesale trade is anticipated, tenants would provide customer amenities such as showrooms, product displays, and parking. A well-planned industrial park would encourage complimentary businesses at the same location for customer convenience.

The area is unused and the proposed reuse as an industrial park fully supports the long-term land use plan. Because the proposed interim reuse is identical to the approved long range land use plan prospective businesses should find the area attractive even though some facility investments would be needed. The proposed reuse activity is projected to have an immediate positive impact on Guam's economy by stimulating purchases, attracting compatible businesses, providing employment, and boosting the Territory's tax base.

SRF Closure.

As an existing ship repair facility, the SRF is well-equipped and well-located for its function. The area has over 3,000 feet of operational wharf space, is equipped with two gantry cranes (although one appears to require repair), and two floating cranes. There is deep water—approximately 65 feet—on the northern edge of the facility. The area is ideal for continuing ship repair operations. Because of these characteristics, it is likely that at least part of the area will continue to be used for ship repair work. If some the total available area is converted to another use, the most essential SRF buildings and equipment will remain for ship repair functions.

Obviously, the mere presence of a tremendous amount of highly qualified skills and the availability of a working facility adds to the argument for continuing a ship repair function. In the short term, that is certainly a viable alternative, and could even offer extraordinary growth, if Guam is successful in capitalizing on the substantial work offered by the Foreign Military Sales Program.

At the same time, however, there are no guarantees that the present base ship repair workload will be sustainable. There remain serious questions about the long term intent of the Military Sealift Command, a key, in fact critical, element to SRF restructuring. Moreover, marketing skills will be as important as the efficiency, cost structure, quality, and performance of the SRF itself.

Given the uncertainty of the long term MSC workload, the SRF must aggressively secure a diversified client base. As a start, the Local Reuse Authority should actively investigate the potential for a joint venture between a Taiwanese (or other East Asian) entity and a local Guamanian industrial operator. This proposal has many advantages:

- Taiwan already has a capable and sophisticated ship repair industry with several logical potential business candidates;

- The Taiwan Government would have a natural incentive to request that the ship repair work done on Foreign Military Sales ships be performed in Guam, both due to Guam's competitive rates with U.S. shipyards, and due to the monetary profits that would accrue to a Taiwanese company;

- Because the SRF would have a Taiwanese financial interest, a synergistic relationship could develop between it and other Taiwanese concerns, such as the Taiwanese fishing fleet, resulting in an increase in the repair of long liners and purse seiners.

- Guam would benefit from developing a solid local business entity with stronger local ties and concerns; and, most importantly,

- This proposed business entity would appear to have the greatest prospects for attracting workload, maximizing local job preservation and growth, and expanding the local economic development.

In the long term, regardless of the success of the ship repair business, other alternatives, particularly those that are water-dependent, such as a transshipment container yard, appear attractive for mixed use of the SRF area. One of Guam's primary visions is to become a major, if not *the major* transshipment center in the western Pacific. That dream will be difficult to realize without a harbor capable of handling large post-Panamax vessels of 6,000 TEU and greater with drafts in the 40 to 45 feet range.

For the long term, Guam should keep its options open with respect to the use of the 50 to 100 acres that are not needed for a full-service and privatized ship repair facility. Should future events and effective marketing result in a positive outlook for Guam to transform itself into a major transshipment center, then the northern edge of the SRF area could prove ideal. Should transshipment capabilities be not realized, the area could serve as a new Port headquarters and administration area with a control tower for the Harbor Master. The SRF area is sufficiently large that multiple functions can co-exist. In the long run, use of excess areas for functions compatible with ship repair in a mixed-use atmosphere, will result in an ultimate win-win solution.

FISC Disestablishment.

The Navy has expressed a desire to maintain ownership and operational control of the FISC as a department under NAVACTS while gradually commercializing its functions. Initially, the Navy intends to outsource only a few specific services. That plan is not advantageous to Guam's economic development for a variety of reasons, including the fact that:

- Federal ownership and operation of the FISC deprives the local government of tax revenues; more importantly, however,

- Federal ownership and operation of the FISC not only hinders the development of a robust private shipping industry needed for optimal redevelopment of the former Navy facilities, but also the successful development of other surplus Navy facilities; and,

- If the Navy makes future reductions in the Guam supply operations, the resulting excess facilities may not be transferable under the advantageous base closure regulations.

A better alternative for Guam is to privatize the FISC—a scenario likely to prove of significantly greater benefit to Guam. In basic terms, it calls for a procurement process in which a major contractor capable of operating a defense facility is selected. The PIP alternative has advantages for both the Navy and Guam:

- For the Navy—
  - Turning the FISC over to a private operator is an option for cutting infrastructure and other operating expenditures and releasing funds for other pressing defense priorities.
  - In many circumstances, private contractors can operate facilities more efficiently than the Department of Defense.
  - Private contractors have also been proven more flexible and capable of adapting to changing needs and circumstances—they can operate with more freedom from the strictures of federal procurement and personnel regulations.
- For Guam—
  - A private operator of the FISC would have the incentive to facilitate shared use possibilities—creates an opportunity for Guam to cultivate a broader private shipping industry through shared or joint use of the existing port infrastructure.
  - A private operation of the FISC can have a synergistic effect with other redevelopment initiatives for Guam's harbor facilities—cumulative effect will be the retention and attraction of workload to Guam, resulting in higher levels of port employment.
  - If future Navy operations decline, and if a privatized FISC is operational, the community would have a head start on developing the economic activity needed to offset the loss of Navy business

In implementing a privatization-in-place initiative, considerable liaison and negotiation with the Navy over a variety of topics ranging from potential Navy workload to setting specific lease terms to protect the Navy's options in a national emergency are fore-

seen. The process is necessarily lengthy—21 or more months. Nonetheless, the potential advantages of having a robust private enterprise operating the FISC are more than sufficient to outweigh the costs in time and effort needed to realize such an outcome. This calculus is even more compelling when the economic impacts of a successfully privatized FISC are compared with the relatively meager benefits of the outsourcing being proposed by the Navy.

Implementation

An important implementation consideration is determining the type of entity that will operate each of the facilities turned over by the Navy to the LRA for reuse. The range of operator options is very broad and include operation by an existing or a newly created entity within the Government of Guam. Local Guamanian companies will be the preferred choice for many of the potential reuses contemplated and opportunities for local businesses will be an important consideration in selecting among reuse options. In some instances, however, an operator from outside Guam's business community will be the most appropriate. This may occur when operations are specialized, requiring extensive experience to attract the needed level of business and to successfully convert a government facility to a commercial venture. These opportunities will often result in joint venture opportunities for local companies with the stateside or foreign companies. Extensive local subcontracting is usually used by these ventures, adding further work for local businesses.

In terms of facilitating immediate redevelopment requirements, the precarious, revocable-at-will nature of the license makes it a problematic foundation for even short-term business decisions. Therefore, absent a particular and compelling need for an expedited bridging action with regard to a prospective business tenant, the need for stability argues for the use of an interim lease as the sole property access mechanism.

Once the reuse options have been assessed and a plan determined, then specific financial considerations can be thoroughly reviewed. Initially, this involves an evaluation of expected revenues—including income from lease payments, property sales, and added tax revenues. Costs are then calculated.

Time phasing of the capital costs is an important step in this analysis along with projected changes over time in the operations and maintenance expenses during the financial review period. The expected revenues also need to be time phased in a very realistic manner. This analysis could lead to a determination that costs will exceed revenues early in the reuse process. Adjusting the expenditure of capital improvement funds might reduce this deficit, but only if it does not significantly reduce the potential for revenue. If the revised

analysis still leaves a significant deficit, then alternate sources of revenue must be investigated.

Bringing market realism to the reuse planning process is a key element of the marketing strategy. Guam's location requires a very wide geographic scope and sophistication in its marketing efforts. While primary focus will be on local, Guamanian firms, the large size and complexity of some of the reuse properties will require broadening to include stateside companies as well as those from East Asia and other parts of the Pacific basin. The reuse areas must be redeveloped in a manner that creates properties that are responsive to the needs of the firms in the target industries. This includes creating real estate that meets the client's physical requirements including size, location, amenities, and related infrastructure requirements.

As the designated Local Redevelopment Authority, GEDA will have continuing overall responsibility for completion of the reuse plan and its implementation. Nothing has yet been identified which would cause a change in this determination. While GEDA is expected to retain its leadership role, other Guam governmental entities, though they may not be receiving leases directly from the Navy, will become more involved as implementation progresses. For example, during the transition between Navy and Guam ownership, there will be a transfer of responsibility for providing municipal-type services, including substantial amounts of caretaker activities. It is expected that Guam's public works agencies will have responsibilities for implementing this transition.

The redevelopment process associated with BRAC is fraught with uncertainty. Time estimates are contingent upon the occurrence or non-occurrence of both dependent and independent events. It therefore remains imperative to understand the underlying process and to keep apprised of the ever changing legislations. We look forward to working with the LRA, the Navy, and the public in implementing the alternatives outlined in this draft plan.

GMP
ASSOCIATES, INC.
Engineers/Architects

Introduction

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1 Introduction

1.1 Background

The 1995 Defense Base Closure and Realignment Commission approved four recommendations that directly affect facilities currently operated by the U.S. Navy in Apra Harbor. The four actions are the realignment of Naval Activities, Guam; the realignment of Public Works Center, Guam; the closure of Ship Repair Facility, Guam; and the disestablishment of the Fleet and Industrial Supply Center, Guam. The specific recommendations are:

Naval Activities, Guam—Realign Naval Activities, Guam. Locate all Military Sealift Command assets and related personnel and support at available DoD activities or in rented facilities as required to support operational commitments. Disestablish the Naval Pacific Meteorology and Oceanographic Center-WESTPAC, except for the Joint Typhoon Warning Center, which relocates to the Naval Pacific Meteorology and Oceanographic Center, Pearl Harbor, Hawaii. Disestablish the Afloat Training Group-WESTPAC. All other Department of Defense activities that are presently on Naval Activities may remain either as a tenant of Naval Activities or other appropriate naval activity. Retain waterfront assets for support, mobilization, contingencies, to support the afloat tender, and to support shared use of these assets consistent with operational requirements if appropriate. Dispose of property owned by Naval Activities declared releasable under the 1994 Guam Land Use Plan with appropriate restrictions.

Public Works Center, Guam—Realign Public Works Center, Guam, to match assigned workload. Close the officer housing at the former Naval Air Station, Agana, Guam.

Ship Repair Facility, Guam—Close the Naval Ship repair Facility, Guam except transfer appropriate assets, including the piers, the floating drydock, its typhoon basin anchorage, the recompression chamber, and the floating crane, to Naval Activities, Guam.

Fleet and Industrial Supply Center, Guam—Disestablish the Fleet and Industrial Supply Center (FISC), Guam. Retain appropriate assets and the FISC fuel facilities, including piers D and E, tank farms, and associated pipelines and pumping systems, under DoD operational control to support military services fuel requirements.

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The combination of these recommendations eliminates the U.S. Navy's needs for many of their current facilities located in or adjacent to Apra Harbor. The recommendations, however, are not explicit in the identification of the ultimate disposition of many of the specific Apra Harbor facilities. The Navy has provided several versions of their proposed excess facility designation, with changes still occurring. Consequently, substantial negotiation efforts still appear to be necessary to reach a final decision on the "footprint" of the property to be declared surplus by the Navy.

Considering the great impact of the proposals on the economy of Guam, the Defense Base Closure and Realignment Commission expressed concern about this issue to the Navy during their review process. In response, the Navy formally stated their position concerning support for economic reuse of the facilities in a letter from Assistant Secretary of the Navy Robert Pirie. The following is a portion of that letter:

> "It is our objective to convey, through long-term lease, outright transfers, or any other mutually agreeable arrangement, as much of the land and facilities as possible from the affected activities on Guam so as to stimulate local economic growth while, at the same time, providing us [the U.S. Navy] with the strategic flexibility to maintain the necessary operational access to Guam port facilities."

Navy officials in Guam and in Washington, DC, have continued to state in general terms, their interest in supporting Guam's economic growth through the transfer of property, facilities, and equipment. This Navy support includes the potential for the early transfer of some of the properties when interim reuses are available.

1.2 Government of Guam Goals

1.2.1 Guam's Concerns

As reported by the Defense Base Closure and Realignment Commission in its Report to the President, Guam expressed a number of concerns with respect to the proposed closure, realignment, and disestablishment of naval facilities at Apra Harbor. These concerns, which were expressed prior to the closure decision, are quoted from the Report as follows:

> Naval Activities (NAVACTS) Realignment.
>
> The Guam community expressed concern on a variety of issues. Foremost was the issue of reuse. The community believes it should be given every opportunity for full use of the facilities and property

for economic revitalization. The community believes this is essential in light of the unique difficulties Guam has experienced since the end of World War II.

The Guam community argued two other related scenarios should be looked at instead of the proposed recommendations. First, the reference in the receiving site should be removed from all recommendations. This would give the Navy more flexibility in properly stationing the assets to meet operational requirements.

Second, all accepted recommendations should be executed on the last day of the two year implementation period. This would allow a two year transitional period and permit more time for economic revitalization planning.

In addition to the alternative scenarios, the community voiced concern over the land disposition process. During the turnover process associated with Guam Land Use Plan 1977 (GLUP 77), lands were tied up in legal proceedings for decades, thus removing any chance for revitalization. The community asked that all lands marked as excess during GLUP 77 and 94, which had not been turned over for reuse, be included in the Commission's recommendation.

The community also asked the Commission to direct the Navy to bring to full, efficient, working order any facilities that were to be closed before being turned over to the community. This included Piti Power plant, fuel farms and any piers damaged by the last earthquake.

Finally, the Guam community asked the Commission to close the Naval Magazine and that its associated water reservoir be turned over to the Government of Guam. The magazine would then be consolidated with the magazine at Andersen Air Force Base, Guam.

Public Works Center (PWC) Realignment.

In addition to the concerns mentioned in the Naval Activities, Guam section, the community expressed concern over the proposal to retain the officer housing at the former Naval Air Station (NAS) Agana, Guam, and over the status of the Piti Power Plant. The community

believes the officer housing should be turned over to the community because it is the only part of the former NAS that was retained. In addition, the community believes that because the housing is in a separate area, retaining it would not be consistent with the Guam Land Use Plan (GLUP). which stated consolidation of facilities was a primary goal. The community further believes there is sufficient housing available for military officers. The community is worried that the Navy would not maintain the Piti Power Plant prior to turning it over to the Government of Guam. Additionally, the community believes that because the closings or realignments will not reduce any PWC functions, closing it would not make sense.

Ship Repair Facility (SRF) Closure

In addition to the concerns mentioned in the Naval Activities Guam section, the community expressed concern Guam was being penalized under the Navy's interpretation of 10 U.S.C. 7309, which has prohibited performance of any non-voyage repair work on U.S. Navy vessels other than those homeported in Guam. If Guam is prohibited from bidding on U.S. ship repair work, then a major potential source of income would be excluded from any economic revitalization efforts. The community also argued the best way for the facilities and equipment to be maintained at the SRF would be for them to be used by the private sector because the high humidity and heat would deteriorate the equipment if it were left idle.

Fleet Industrial Supply Center (FISC) Disestablishment

In addition to the concerns mentioned in the Naval Activities Guam section, Guam's community expressed concern that the fuel farm the Fleet and Industrial Supply Center (FISC) owns and operates could not be turned over to a private organization because of its age, as well as a possible requirement to store DoD fuels. Additionally, the community expressed concern the language in the recommendation was not specific enough for Guam to be assured it would be able to reuse the facilities for economic revitalization.

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1.2.2 Vision for Apra Harbor

Once the BRAC 95 decisions were final, Guam turned its energies into achieving two principal goals as it redevelops excess Navy lands in the Apra Harbor area—

- Stimulate and diversify its economy; and
- Re-employ those workers who will be laid-off.

Members of the BRAC Executive Staff Oversight Committee (ESOC), the BRAC Steering Committee, and the seven Staff Working Groups—Transition and Port Development, Economic Development, Environmental, Human Resources, Homeless, Excess Lands, and Legal—met in an all-day Team Building Workshop on April 19. There, mission statements and action plans were presented for discussion and consideration by the committee-as-a-whole. Following the presentations, recommendations were synthesized, and the following vision statement was crafted (and later adopted):

> "Redevelop portions of the naval base for best and highest use, integrating its facilities and functions with those of the Commercial Port and Guam's business community. Revitalize these assets to diversify products and services; stimulate the economy to generate new capital, retain critical skills, and promote the creation of a variety of new employment opportunities; provide for the homeless; increase recreational and leisure opportunities; and advance tourism."

1.2.3 Redevelopment Objectives

In order to realize its vision, Guam seeks to maximize opportunities to attain the following intermediate objectives:

1. Wharfage and Acreage for a Full-Service Fishing Port.

   (a) Wharf frontage for offloading fish catches and taking on voyage supplies.

   (b) Facilities and open space adjacent to the fishing wharf for bait storage, ice plant, packing plant, salt storage, ship supplies, fisherman's storage.

   (c) Expeditious completion of the environmental baseline survey (EBS) to facilitate the early lease of properties prior to deed transfer.

   (d) Completion of clean-up plans and mitigation consistent with final reuse.

2. Facilities to Support Increased Cruise Ship Arrivals.

   (a) Immediate licensing, and later deed transfer of wharf frontage for accommodating cruise ships.

   (b) Construction of land-side facilities to facilitate bus access and land tours.

   (c) Expeditious completion of the EBS to facilitate the early lease of properties prior to deed transfer.

   (d) Completion of clean-up plans and mitigation consistent with final reuse.

3. Ship Repair Facilities and Industrial Yards.

   (a) Closure and fee simple deed transfer of the naval ship repair facility (SRF) for conversion into a maintenance and repair facility to support industrial and light manufacturing functions.

   (b) Long-term maintenance agreement for servicing all boats that will remain assigned to NAVACTS.

   (c) Opportunity to service Military Sealift Command (MSC) ships, particularly if the Navy elects to continue their forward deployment in Guam.

   (d) Sustain current employment levels.

   (e) Expeditious completion of the EBS to facilitate the early lease of properties prior to deed transfer.

   (f) Completion of clean-up plans and mitigation consistent with final reuse.

4. Warehousing and Open Storage Areas.

   (a) Fee simple transfer and privatization of existing FISC warehousing operations so private commercial enterprises can support navy needs as well as the private sector.

   (b) Establish the Navy as a long-term customer.

(c) Expeditious completion of the EBS to facilitate the early lease of properties prior to deed transfer.

(d) Completion of clean-up plans and mitigation consistent with final reuse.

5. Acreage for Commercial Retail Facilities.

(a) Acreage/open space adjacent to cruise ship/dinner cruise wharf(s) for the development of a commercial and retail center to service passenger cruise travelers and dinner cruise guests.

(b) Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

6. Facilities to Promote Tourism.

(a) Transfer of all lands/facilities on Drydock Island (except for fuel point needs) to allow the development of a tourist-oriented theme park complex, recreational facilities, and preservation of conservation areas.[1]

(b) Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

7. Expanded Recreational Opportunities to Improve the Quality of Life.

(a) Transfer of the Sumay Cove marina for joint-use as a small boat marina.

(b) Joint-use of Orote Point for selected recreational purposes.

8. Conservation Areas to Preserve the Environment.

(a) Transfer of properties on Orote Point except that needed for naval housing and ammunition offloading to allow for joint recreational areas, restoration of

[1] Subsequent to the development of these objectives, the Government of Guam and the Navy agreed to transfer lands on Drydock Island using non-BRAC procedures.

historical sites, and tourist-related facilities that are compatible with the ESQD requirements of Kilo wharf.

(b) Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

9. Housing for the Homeless.

(a) Consider the use of selected excess navy lands for accommodating Guam's homeless.

(b) Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

1.3 Purpose of this Plan

With the large number of jobs lost because of the Navy closure and realignments, economic reuse of the former Navy facilities is critical to Guam's economy. Initial economic development activities by the Guam Economic Development Agency (GEDA) have identified some facilities for immediate reuse, creating a number of new jobs and significant economic benefit to Guam. Other facilities are more suitable for long term redevelopment.

The primary purpose of this Draft Business Reuse Plan is to assist the Government of Guam in *charting a course for economic recovery*. The plan, in conjunction with the clear articulation of Guam's Nine Point Vision Statement (please refer to Appendix A), will provide the options from which the community will finalize its ultimate view of "what to reuse" and "how to reuse" Apra Harbor. These two documents will enable Guam to ultimately finalize a blueprint for reuse implementation for final approval and transfer of the surplus property by the Navy.

This Plan will provide means for the community to identify what it considers to be the "highest and best use of the land and facilities," while ensuring that this stated use will not impact negatively on the long-term attainment of the Nine Point Vision. Again, these plans provide the baseline data needed to evaluate the various potential reuse alternatives for the property. Often, a review of the data and alternatives leads the Local Reuse Authority (LRA) to move beyond initial tasks—for example, the on-going initiative to attract interest in the foreign military sales program.

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The desired end result of the upcoming discussions and review of this plan is the development of a true community consensus on the concept for reuse of Apra Harbor. It is important to realize that the final outcome of the upcoming debates may differ significantly from that which was originally proposed, and that the general public may hold opinions and views quite contrary to those supported by government and business leaders. The consensus formulated will serve as the take-off point to finalize property uses with the Navy and potential commercial and government users of the surplus property.

When finalized, the plan will also allow the Navy to determine identify maintenance, repair, and lease provisions of port facilities to support both Navy missions and the commercialization of excess properties. The plan will allow the Navy to assess local capabilities and their compatibility with ongoing and future Navy mission requirements. The Final Business Reuse Plan will also define the consensus redevelopment configuration for purposes of conducting the NEPA (National Environmental Policy Act) analysis, the ensuing cleanup, and eventual disposal of the property by the Navy.

While this Draft Plan offers various alternatives, along with draft recommendations, a final community consensus must be achieved upon which to prepare a Final Business Reuse Plan for submission to the Navy. The Final Plan starts the clock on the various issues required for final property disposition.

1.4 Study Methodology

Preparation of this Draft Business Reuse Plan completes Phase I of the redevelopment effort. During Phase I, data analyses were conducted, interim and preliminary reports were published, and reuse alternatives were identified to assist in developing the community consensus necessary for initiating Phase II.

This Draft Business Reuse Plan updates and supersedes all previous interim and preliminary submittals of Phase I which should now be destroyed. These earlier documents include the following:

- Initial Report on Data Collection and Evaluation
- Summary Report on Data Collection
- Legal and Regulatory Issues Significantly Impacting Guam Port Reuse
- Interim Reuse Plan for Apra Harbor: Dry Dock Island, Drum Lot at Polaris Point, and Victor Wharf
- Preliminary Plan for the Ship Repair Facility (SRF) Guam

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- Preliminary Market Study
- Concept Paper for FISC Privatization

This is a draft report that focuses on presenting redevelopment alternatives and recommendations that will assist the Guam community to arrive at a consensus on their final desires with respect to the reuse of excess lands in Apra Harbor. The following methodology was used in carrying out this study. The plan itself is organized along the lines of the methodology.

1. Current, as well as historical operations, and physical facility assets were inventoried and reviewed to form a bases for analyzing potential reuse alternatives. The asset evaluation quantifies the real and personal properties, and evaluates their condition and suitability for reuse from a functional perspective. Section 2 provides a *Description of Reuse Areas*—NAVACTS, SRF, and FISC.

2. Preparation of a thorough market study is an integral step in overall reuse planning, and is usually performed concurrently with facility inventories. The study aims to identify economic development needs, as well as their viability and potential for sustainability in the context of local, regional, and international economic dynamics. A *Market Assessment* was performed and its findings are presented in Section 3.

3. Closure, realignments, and disestablishments will present a unique opportunity for diversifying Guam's economy as well as significant challenges with respect to reemployment opportunities for former Navy employees. Reemployment opportunities for projected displaced workers are discussed in Section 4, *Employment Needs*.

4. Once (1) what assets are available, and (2) what the market will bear have been determined, an economically and environmentally feasible long term plan can be developed and evaluated. Effective planning requires a clear understanding of long-range objectives and a vision of long-term requirements. Section 5, *Planning Considerations*, presents the overall strategic plan for the reuse of Apra Harbor; outlines statutory and regulatory considerations for planning, operating, and maintaining the harbor and its facilities; outlines considerations with respect to shipping channel and turning basin configurations; and discusses function-based facility planning modules.

5. Short- and intermediate-range alternative uses are evaluated in terms of their compatibility with the long-range objectives developed in Section 5. Section 6,

Reuse of NAVACTS Areas, presents redevelopment alternatives for two distinct areas: (1) Victor Wharf in Inner Apra Harbor, and (2) Drum Lot at Polaris Point.

6. Section 7, *Reuses for the SRF Area* describes short and intermediate term options for converting the government-owned and operated Ship Repair Facility (SRF) into a commercial, privately-owned and operated facility as well as potential non ship-repair alternatives.

7. The Fleet Industrial Supply Center is being disestablished—not closed. The Navy has expressed a desire to maintain ownership and operational control of the FISC. Such a plan is not the most advantageous for Guam's economic development. Section 8, *Reuse of the FISC*, offers an alternative that calls for the *privatization* of the FISC—a scenario likely to prove of significantly greater benefit to Guam.

8. In concluding the plan, Section 9 discusses several *Implementation* issues. Among them are operational factors, licensing and interim leasing, financial considerations, development of a marketing strategy, organizing for implementation, and a projected timetable for Phase II (and beyond) of the Business Reuse Plan.

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Description of Reuse Areas

2

2 Description of Reuse Areas

2.1 Naval Activities, Guam

The command presently known as Naval Activities, or NAVACTS, was originally established on Guam as Naval Station, or NAVSTA, in August 1899. At that time, a formal government was established with the entire island being designated as the U.S. Naval Station. Until the capture of the island by the Japanese during World War II, the Commanding Officer of the U.S. Naval Station was also designated as the Governor of Guam.

Guam surrendered to a Japanese landing force on December 10, 1941. It remained under Japanese rule until D-Day on Guam, July 21, 1944. A unit called "Lion Six" was subsequently charged with the mission to provide everything needed for the operation of a naval base. This unit was the forerunner of the present NAVACTS Guam. It was a command of huge proportions with every type of fleet service. Subsequently, "Lion Six" became Naval Operating Base, Marianas, with the Naval Station being a component activity. In September 1956, Naval Operating Base, Marianas, was disestablished and the Naval Station was reassigned to Commander, U.S. Naval Forces, Marianas (COMNAVMAR).

In July 1967, NAVSTA Guam was placed under the Commander Service Forces, U.S. Pacific Fleet, (COMNAVLOGPAC). Commander in Chief, Pacific Fleet (CINCPACFLT) is the major claimant and COMNAVMAR has area coordination responsibilities.

In March 1993, NAVSTA Guam was renamed Naval Activities, Guam (NAVACTS, Guam). NAVACTS controls land in several non-contiguous area in and around the Apra Harbor in west central Guam. The total land area is approximately 4,800 acres.

There are two areas of NAVACTS which are included in this Reuse Plan, as they are deemed excess and will be turned over to the Government of Guam. Victor Wharf has been declared excess and will be turned over to the Government of Guam via fee simple transfer upon approval of final reuse by the Navy. The Polaris Point Drum Lot was also declared excess as part of the *Guam Land Use Plan 1994 (GLUP 94)*.

2 Description of Reuse Areas

2.1.1 Victor Wharf

Victor Wharf is an existing wharf structure located in the southwestern portion of Inner Apra Harbor. The entire wharf is approximately 3,465 feet long. Wharf construction is based on sheet piles which are concrete capped, a tied back quaywall, and an asphaltic concrete paved deck. Since the August 1993 earthquake, Victor Wharf is the only wharf under the cognizance of NAVACTS, Guam. Before the earthquake, Uniform wharf was also under the command of NAVACTS. The U.S. Coast Guard and Navy SEALS are two tenants of NAVACTS that are located on Victor Wharf. The Navy SEALS are located on the landside of berths V-1 and V-2. The U.S. Coast Guard's waterfront area is at berth V-3 and its landside facilities extend from V-3 to V-4. The remaining berths, V-4, V-5 and V-6 are used by NAVACTS for visiting ships, etc. Figure 2.1 provides a detailed overview of existing Victor Wharf facilities.

2.1.1.1 Victor Wharf Characteristics and Water Access. Victor Wharf is located at the southwestern portion of Inner Apra Harbor and has relatively shallow draft. The wharf area is limited to accommodating vessels that can negotiate water depths at the entrance channel to Inner Apra Harbor which are between 33 and 40 feet. Inner Apra Harbor depths generally vary from 30-40 feet. The current dredge depths along Victor Wharf appear to range from approximately 24 feet to approximately 30 feet. This is based on information obtained from the 1993 NOAA soundings for Apra Harbor. The Inner Harbor's natural flow and flushing system is relatively weak. This may pose a pollution constraint to high volume uses if any residue from operations, e.g. fish and/or bilge waste, ultimately reaches the harbor water. There is a new "Bilge and Oily Water Transfer Station" (BOWTS) facility currently under construction at the southern end of Victor Wharf. This facility will be included in any reuse of Victor Wharf as it will be considered an integral infrastructure of Victor Wharf.

2.1.1.2 Victor Wharf Land Access. For planning purposes, it is convenient to separate Victor Wharf into two areas: Victor Wharf-South and Victor Wharf-North. Victor Wharf-South is accessible through the Main Gate located at Marine Drive. The southernmost 800 feet of Victor Wharf is currently accessible without passing through the Main Gate. The U.S. Coast Guard facility is accessible through the Main Gate via Sumay Drive, or by a secondary road which parallels Victor Wharf and runs into Marine Drive near the Main Gate. Victor Wharf-North is accessed via Sumay Drive or the secondary road.

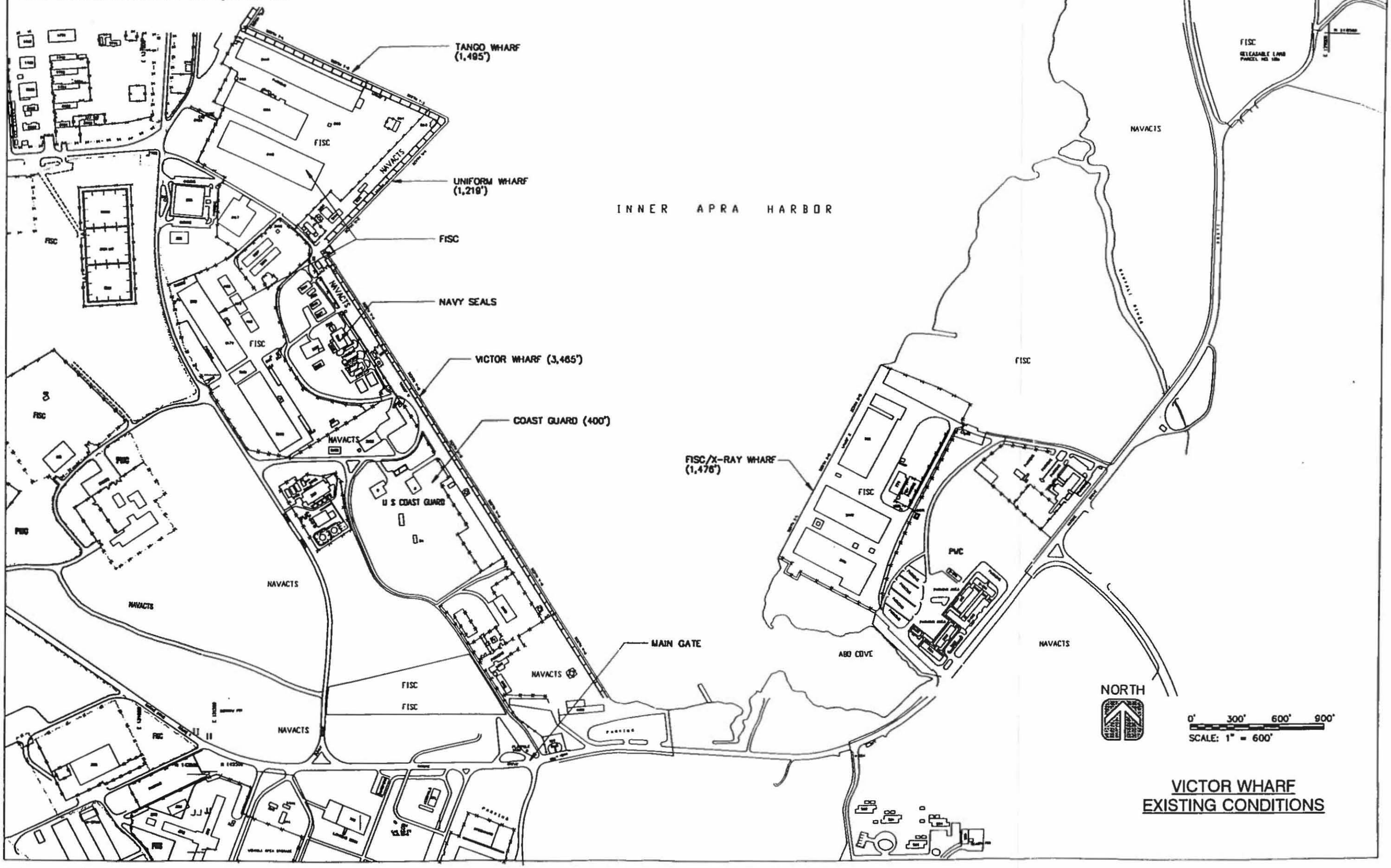

TANGO WHARF (1,495')
UNIFORM WHARF (1,219')
FISC
NAVY SEALS
VICTOR WHARF (3,465')
COAST GUARD (400')
FISC/X-RAY WHARF (1,476')
MAIN GATE
INNER APRA HARBOR
FISC
NAVACTS
U S COAST GUARD
PWC
ABO COVE
NORTH
0' 300' 600' 900'
SCALE: 1" = 600'
VICTOR WHARF
EXISTING CONDITIONS

Figure 2.1

2 Description of Reuse Areas

2.1.2.3 Victor Wharf Backlands. Various buildings and structures are adjacent to Victor Wharf with uses that range from general warehousing and storage to administrative uses and Navy SEALS facilities. Generally, these buildings appear to be in good condition.

2.1.2 Drum Lot at Polaris Point

The property within Polaris Point called "Drum Lot" has been identified as releasable land, parcel number 14. This parcel is currently under the cognizance of NAVACTS, and is scheduled for transfer to the LRA as excess military lands, under the study referred as the *Guam Land Use Plan of 1994* (GLUP'94). Figure 2.2 provides an overview of the Drum Lot and vicinity.

The Drum Lot property is regularly-shaped except for the shoreline at the northern boundary. The total area is approximately 83 acres. The topography is reasonably level and low lying with approximately one-half of the site being within the 100-year flood zone. The northeast corner contains approximately 15 acres of wetlands bisected by the Aguada River. The entire site is reclaimed land, having been filled as part of the dredging of Inner Apra Harbor.

Good landside access to the site is provided by the signalized intersection at Marine Drive, a four-lane primary highway that connects to a secondary two-lane road through the site. There is no access to Inner Apra Harbor because of existing military properties that lie on the west and south site boundaries. Access to Outer Apra Harbor at the northern boundary is constrained by shoreline wetlands and coral reef flats.

Approximately forty (40) acres of abandoned hardstand remain onsite. They were reportedly used for the storage of fuel bladders.

2.2 Ship Repair Facility, Guam

2.2.1 General

A privatized Ship Repair Facility (SRF) offers significant business opportunities for a commercial operator. In order to assess those opportunities, however, both supporters of a privatized SRF and potential operators should understand the history of SRF Guam, its current operations, and how potential competitors operate. These topics are addressed in the following subsections.

2 Description of Reuse Areas

2.2.2 History of SRF, Guam

The United States originally established the SRF (then known as the Industrial Department of the Naval Operation Base) in January 1945 to support its forces in the Pacific. The facility was initially designed to meet wartime needs and was manned entirely by military personnel. The facility rapidly expanded into a major operation. By the end of World War II, the facility was staffed by over 4,000 personnel, utilized 11 floating drydocks, and had as many as 166 vessels undergoing repairs at one time.

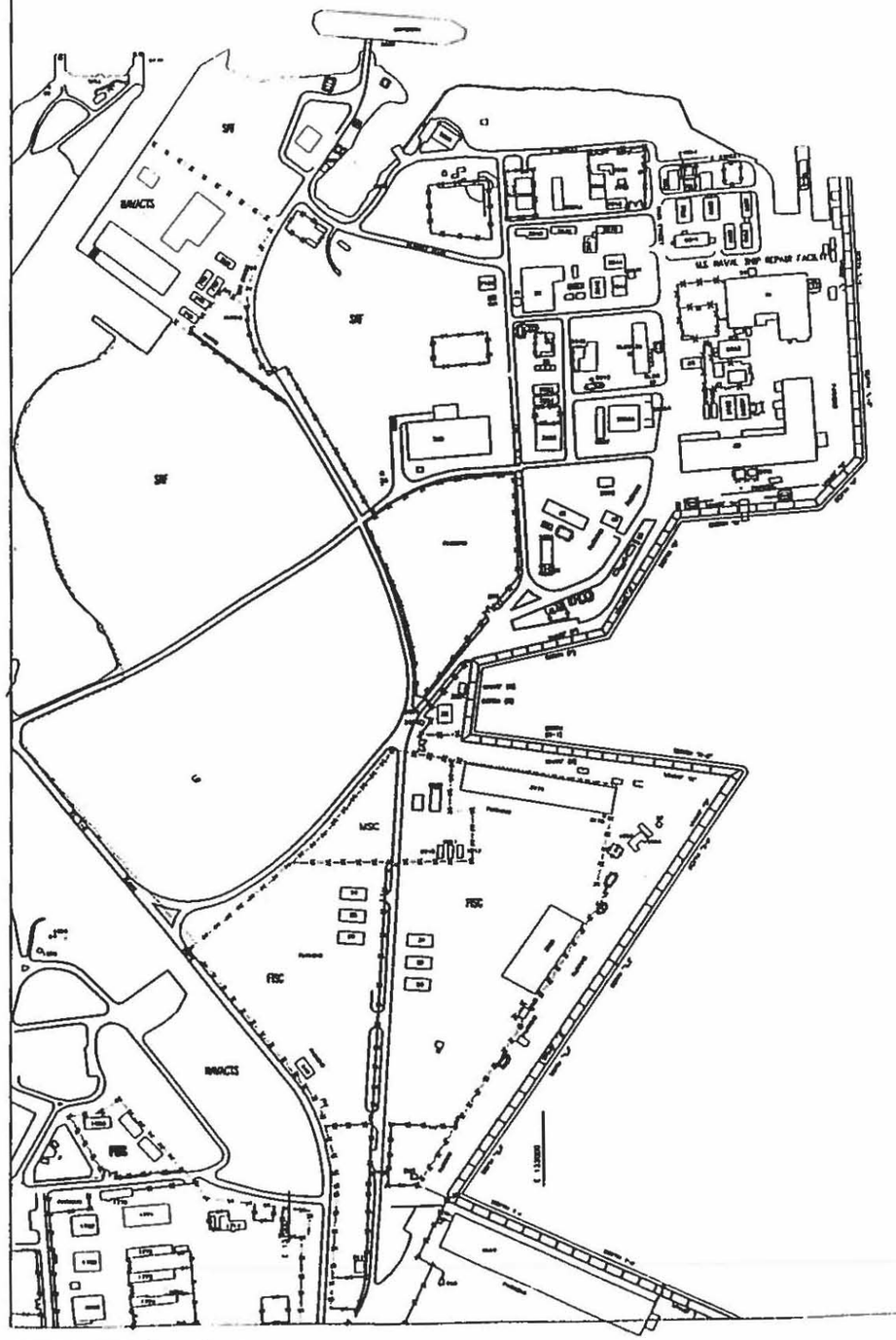
The facility was designated as a Ship Repair Facility in 1951. It is only one of two such facilities in the Western Pacific—the other being the SRF in Yokosuka, Japan—and the only one on U.S. soil. Over the years, its size and staffing has varied to meet changing needs. Between 1967 and 1970, the SRF employed approximately 2,200 people and serviced roughly 400 ships per year. In recent years, the downsizing of the U.S. Naval fleet first led to reductions in personnel, and ultimately led to the decision to close the SRF as a U.S. Navy facility in 1997. As recently as 1993, the facility employed over 1,000 civil service, Filipino contract hires, and military personnel.

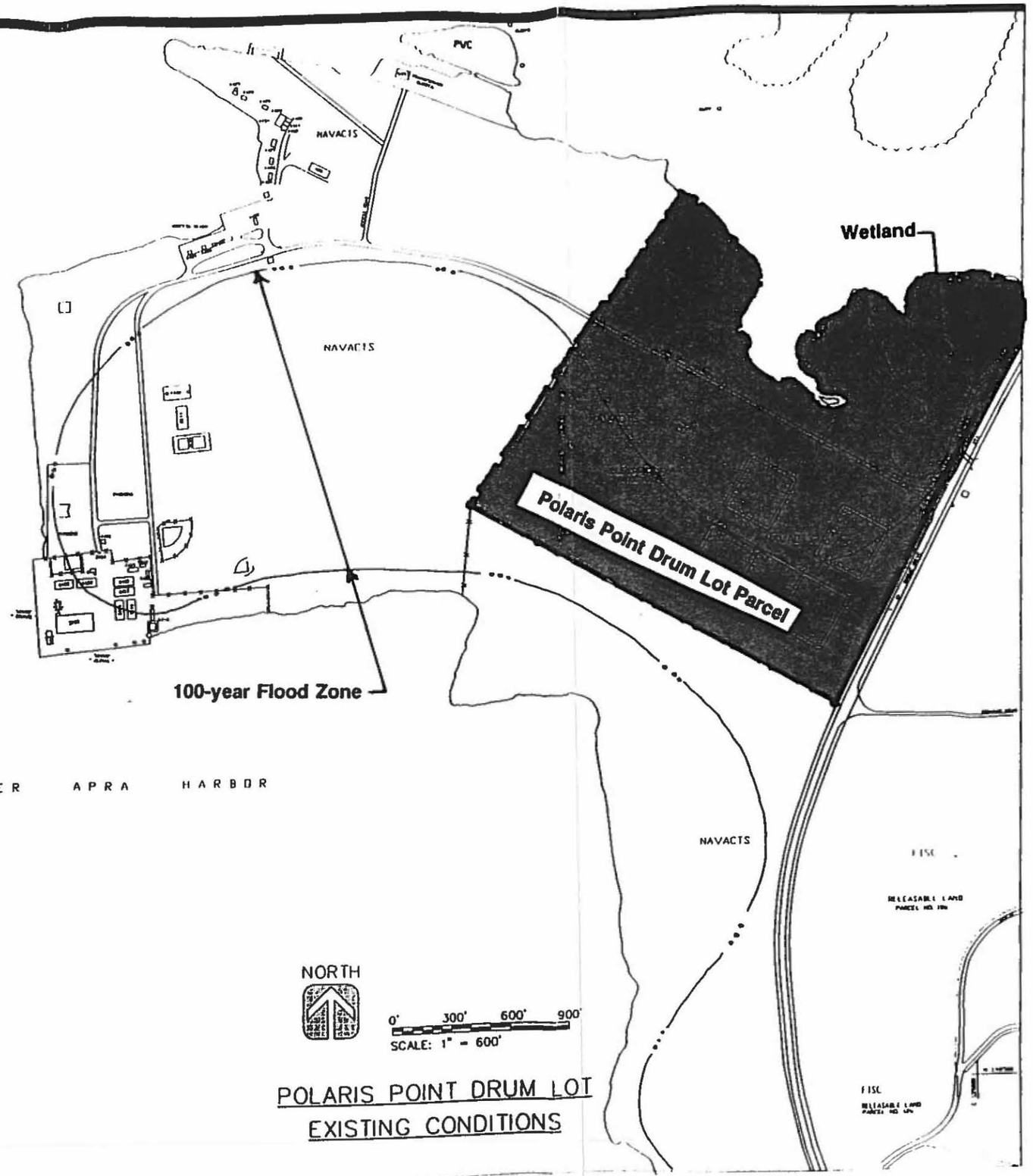
While serving U.S. Navy needs, the SRF developed and maintained major ship repair capabilities to include overhaul and drydocking services. Although the original facility was constructed for approximately 34 million dollars, a more current estimate places its replacement value at 90 million dollars, excluding the costs of the land. The SRF has also supported vital shore-based industrial functions, having numerous capabilities found nowhere else on the island of Guam or in the local region.

2.2.3 Current Status of the SRF

2.2.3.1 Physical Plant. The SRF is bounded on the east and south by several wharves, and on the west by a road to the Explosive Ordnance Disposal (EOD) facility at the east side of Sumay Cove. The immediate area of the SRF is approximately 100 acres[1] as shown in Figure 2.3. Twenty of these acres, however, are devoted to DRMO (Defense Reutilization and Marketing Office) building 2109, and fifty acres of undeveloped land is immediately adjacent to the SRF, west of the EOD access road. However, the latter property may prove difficult to convert for other uses due to its environmentally sensitive,

[1] Some Navy documentation reports that the SRF consists of over 230 acres. Since we cannot account for that size acreage in the vicinity of the ship repair facility, we presume that the number includes lands assigned to the SRF in the Drydock Island area and Radiac Calibration Laboratory near X-Ray wharf. Some of the lands on Drydock Island have been, or are in the process of being transferred to Guam, through non-BRAC disposal mechanisms.





POLARIS POINT DRUM LOT
EXISTING CONDITIONS

Figure 2.2

DRYDOCK ACCESS AREA
(APPROX. 8 ACRES)

DRMO & OPEN STORAGE AREA
(APPROX. 20 ACRES)

MAIN SRF INDUSTRIAL AREA
(APPROX 64 ACRES)

PARKING (APPROX. 8 ACRES)

TOTAL SRF=
APPROX. 100 ACRES

E.O.D. AREA
(APPROX. 9 ACRES)

SRF "WETLANDS"
AREA (APPROX. 50 ACRES)

DRYDOCK
2032
5410
WALL
1797
2028
2030
E STREET
2072
2069
2068
2102
2002
2001A
2018
2014
E STREET
2012
2013
96-1
2010
2009
2008
2004
2006
93-1
MAIN STREET
U.S. NAVAL SHIP REPAIR FACILITY
2040
2039
2070
2071
2044
00472
2041
2042
2043
41
22
39
21
MURRAY ROAD
2100
2109
2108
2107
2106
2105
BOAT PARKING
PARKING
PARKING
OPEN STORAGE
23
38
2049
BLDG 30
5912
BLDG. 30
2053
2054
2055
2056A
2058A
2057
2063
25
DRMO
2109
26
20
5961
PARKING
WHARF "N"
BERTH "N"
BERTH 1-2
PARKING
2078
PARKING
43
42
PARKING
2074
29
BERTH "O"
275
WHARF (P)
BERTH (P)
SUMAY COVE
WHARF (Q)
BERTH (Q)
2081
2076
2077
28
BERTH
(R-1)

NORTH

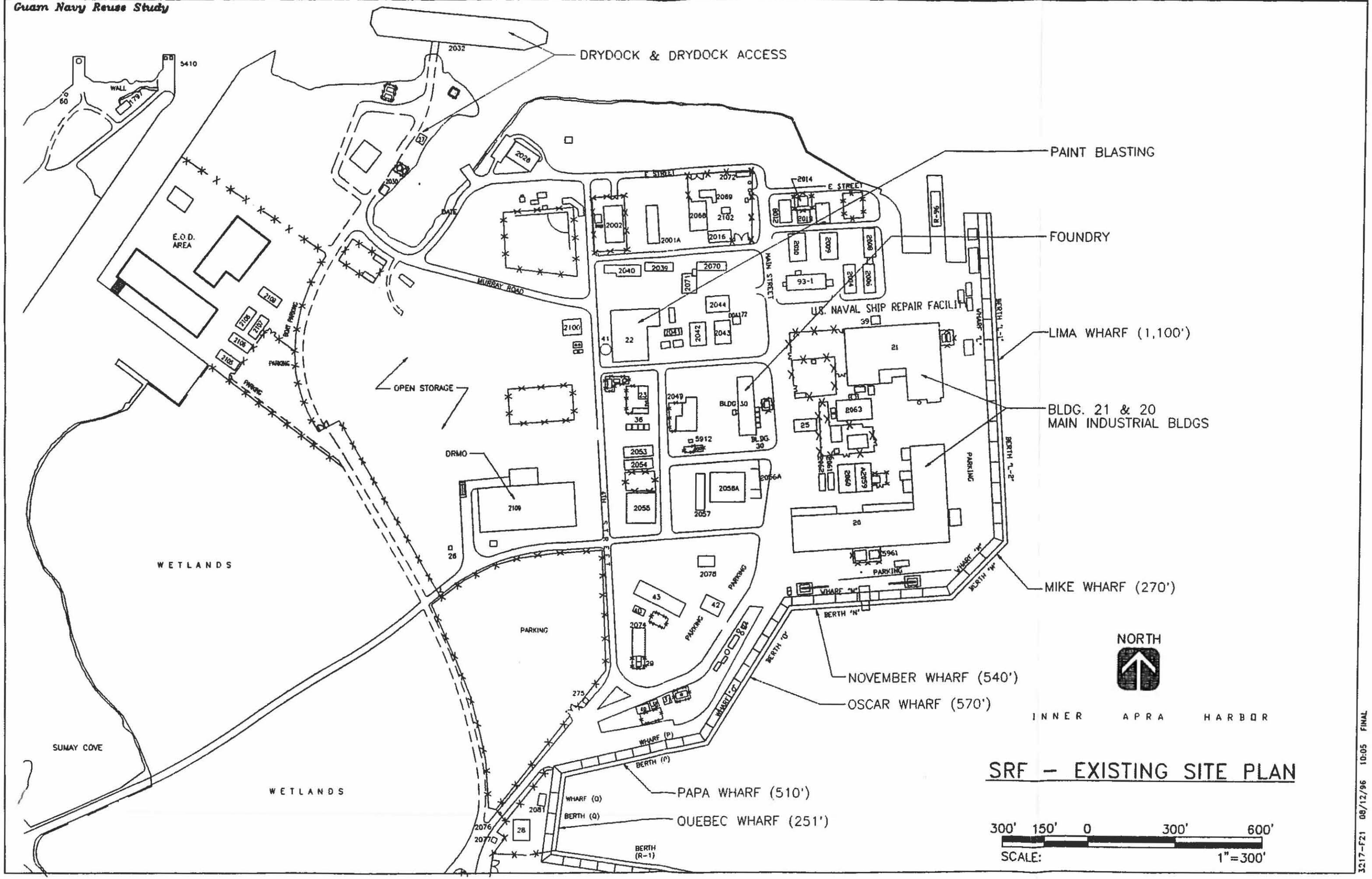
INNER APRA HARBOR

SRF – ACREAGE PLAN

300' 150' 0 300' 600'
SCALE: 1"=300'

3217-F22 08/12/96 10:19 FINAL

FIGURE 2.3



SRF – EXISTING SITE PLAN

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Figure 2.4

wetland condition. Depending on the disposition of the DRMO area, the SRF area ranges from 80 to 100 acres. If the so-called wetland area is usable, up to 150 acres of land are in the immediate vicinity of the ship repair facility.

The SRF is comprised of over 70 buildings on the 100 acre core of the complex and occupy over 470,000 square feet. Buildings 20 and 21 are the two major industrial buildings. These high bay, steel frame buildings are in good condition, and they house shipfitting, maintenance shops, tool shops, storage and work areas, and administration areas. Other buildings, including a foundry, sandblasting and painting building, various laboratories, hazardous material storage, and miscellaneous shops, are described in greater detail in the Facilities Inventory attached as Appendix A to this report. Some of these functions are housed in Quonset Huts and other temporary structures.

Major assets of the facility include over 3,000 feet of wharfage and two major drydocks, AFDM-5 and AFDM-8. AFDM-8 (the *Richland*) is 622 feet by 124 feet with a capacity of 16,000 long tons at 18 inch freeboard, and is currently undergoing a 22 million dollar refurbishment. AFDM-5, a similar, although slightly smaller drydock, was transferred to Apra Harbor from Subic Bay when the latter facility was closed. In a letter dated September 5, 1996, the Secretary of the Navy stated that AFDM-8 will be transferred to NAVACTS upon closure of the SRF. Once on-going overhauls are completed, the drydock will be available for lease (presumably to Guam) since the Navy does not have an immediate need. Title, however, is to be retained by the Navy to support future contingency needs. In the same letter, the Secretary indicated that if Guam also needs AFDM-5 to redevelop the SRF, it too could remain. The Navy, however, is unsure of the presence of PCBs, which if present, must either be removed or an EPA compliance agreement secured. The SRF also includes major equipment such as two rail mounted portal cranes and two floating cranes.

The ship repair facility is served by six contiguous wharves of varying lengths that together total over 3,200 feet in length.

Berth	Length (ft.)
Lima	1,100
Mike	270
November	540
Oscar	570
Papa	510
Quebec	251
Total:	3,241

The SRF and its wharves are generally considered to be in good condition. The 1993 earthquake which damaged other Apra Harbor facilities left the SRF with relatively minor damages—a $2.6 million contract was awarded in March 1995 to repair damages from Lima to Romeo wharves. The repairs were completed in early summer, 1996.

2.2.3.2 Workforce. Currently, the total SRF workforce numbers approximately 500 personnel (the civilian workforce is about 440), a considerable decline from the staff of just over 1,000 as recently as 1993. The large majority of the employees are non-unionized civil service employees, the rest being military personnel and Filipino contract employees. The downsizing has resulted in some loss of capabilities, the most notable being that of the facility's foundry, where the last qualified worker departed over six months ago. Additionally, as the number of employees has declined, issues related to reduced flexibility and lack of surge capacity have been raised.

The SRF workforce includes trained employees in a wide variety of crafts required for ship repair work. Indeed, the SRF workforce is considered to be one of the most highly-skilled, if not the most highly-skilled, and highest-paid industrial workforces found on Guam. Most are graduates of an extensive Navy-operated apprentice training program at Guam covering all major trades.

2.2.3.3 Capabilities. The SRF provides a complete range of ship repair capabilities through several departmental groups. These capabilities include the following:

- Planning/Engineering Department:
  - Availability planning and work scheduling
  - Budgeting and information processing
- Operations Group
  - Shipfitters
  - Sheetmetal
  - Welding
  - Boilermaker and pipefitting shops
  - Non-destructive testing and industrial laboratory services
  - Machining

- Foundry/patternmaker
- Marine machinery
- Refrigeration and air conditioning
- Electrical and electronics repair and calibration
- Metrology

- Support Group
  - Painting/sandblasting
  - Rigging
  - Shipwright
  - Engine and pumps repairs
- Docking Department: Floating drydock services

The SRF also has some special capabilities that are not found in the typical shipyard. Some of these capabilities include a welding school, phosphating facility, corrosion control, silver brazing school, recompression chamber, and skilled workers in underwater cutting and welding, salvage operations, underwater videotaping/photography, and mooring buoy inspections.

Finally, the SRF has facilities and skills typically classified as support services. These include administrative functions, engineering and technical assistance, tool and parts control, supply warehousing, and similar functions.

2.2.3.4 Commercial Involvement. In addition to providing comprehensive ship repair services to the Navy, the SRF has also provided a limited amount of authorized repair and shore support services to the Government of Guam and private agencies. The facility has not engaged in joint service or shared use programs with private sector operators—an operation which has received broader military encouragement in recent years. Because, for all practical purposes, the SRF had dedicated itself to the exclusive management of Navy work, the development of comparable private sector ship repair capabilities has been retarded. Consequently, the island of Guam does not have a major commercial ship repair facility. Commercial demands for drydock work are presently satisfied in Taiwan, Korea, and other Asian ports.

2 Description of Reuse Areas

2.3 Fleet Industrial Supply Center, Guam

2.3.1 General

In conformance with the provisions of BRAC 95, FISC Guam will be disestablished by September 30, 1997. According to local Navy officials, in the near-term portions of the FISC property will be commercialized, providing potential contract opportunities for local suppliers. The Navy's current intentions and long range vision are a tailored logistics support facility to provide for a customer-base that includes three T-AFS ships (for a period of approximately 2-3 years); a Guam based submarine tender; and, those on-island functions where it makes economic sense to do so. Outsourcing of Guam logistics support is being reviewed as an on-going effort. The Chief of Naval Operations (CNO) and CINCPACFLT are finalizing their positions on the Diego Garcia shuttle and T-AFS missions.

2.3.2 History of FISC, Guam

The Fleet Industrial Supply Center originally evolved from a supply support group called D-1 that came to Guam in July 1944 and was officially commissioned as the Naval Supply Depot (NSD) on November 11, 1944.

At the peak of its wartime operations, NSD Guam was staffed with over 13,000 officers and men. With over 2 million square feet of covered storage, ½ million cubic feet of cold storage, and 1 million barrels of petroleum, oil and lubricants (POL) storage capacity, NSD was capable of unloading 140 liberty ships and tankers per month, while servicing up to 75 small craft and combatants per day.

In 1991, the Philippines Senate rejected extension of the base treaties with the U.S. and the Navy decided to close its bases there within 12 months. By February 1992, NSD Guam received the first of what would become a mountain of material shipped from Subic Bay over a 10 month period and in addition to all the material, the depot picked up new tasks in support to the Pacific and Middle East theaters, support ready supply stores in Diego Garcia and Singapore.

On March 1, 1993, NSD Guam became U.S. Fleet Industrial Supply Center (FISC) Guam. This change meant all U.S. Naval Supply Centers and Naval Supply Depots carried the same official title for the first time in history.

2.3.3 Current Status of FISC

Today, although operations have scaled down considerably, FISC Guam continues to occupy some 1,400 acres of real estate with an inventory of 95,000 line items stored, a $62 million annual sale of goods, $41 million in fuel sold and 187,000 requisitions processed annually.

2.3.3.1 Physical Plant. FISC Guam occupies five separate areas within the Apra Harbor Naval Complex. The Sierra and Tango wharf areas, located on the western side of Inner Apra Harbor, includes the main FISC Guam administration, operations, and storage facilities which are supported by approximately 3,400 feet of berth space. All material handled by NSD Guam, except for provisions and POL, are processed here.

There are two buildings within the SRF compound, buildings 23 and 2002, which are under the FISC command. These facilities are for the Navy's Hazardous Materials/Minimization Program, which are handled by FISC Guam.

The X-Ray Wharf area, located on the eastern side of Inner Apra Harbor, includes cold storage, dehumidified storage, and dry storage subsistence facilities which are supported by approximately 1,800 feet of berth space. Receiving, issuing, and storage of food items are handled here.

POL operations occur at two locations. Fueling operations take place at the Delta and Echo fuel wharves located on Drydock Island, a small peninsula extending into Outer Apra Harbor. Fuel tanks and storage operations are located in the foothills east of Route 1. Twenty seven underground tanks with a capacity of 1.4 million barrels are stored at Sasa Valley and Tenjo Vista tank farms.

2.3.3.2 Workforce. The personnel workforce for FISC Guam is a total of 470 personnel, with 414 civil service employees, 13 military officers and 43 enlisted military.

2.3.3.3 FISC Capabilities. FISC Guam provides supply and logistic support services to fleet and shore activities on Guam. The Center also provides supply support to homeported and transient ships, and specified support to every military activity located on Guam. This support incudes the issue, receipt, and storage of fuel, a wide range of data processing and accounting services, and freight terminal services. In addition to the military, FISC provides support to various federal government agencies on Guam, the

2 Description of Reuse Areas

Government of Guam, and various Governments of the former Trust Territories of Pacific Islands.

FISC's services include:

- Services to On-Island Customers
  - HHG storage and delivery
  - HAZMAT storage and handling
  - Contracting Services
  - Stevedores for ammo loading
  - Fuel storage and handling
  - Warehousing
  - Transportation for local delivery
  - Ocean terminal
    - Privately-Owned Vehicles (POV)
    - Receiving
- Military Sealift Command (MSC) Supply Ships (T-AFS)
  - Support of WESTPAC
  - NAVCENT Battle Group Forces
- Initial Loadout
  - Fleet issue load list
  - High issue load list
  - Provisions
- Commercial Resupply
  - Jebel Ali
  - Commercial 20 ft and 40 ft vans (dry/refrigerated/freeze)

- Weekly sailing from Guam Commercial Port with approximately 25 days sailing time
- Diego Garcia resupply by SS Cleveland 8 times/year:
  - Provisions
  - Consumables
  - Parts

- Fuel Farm Storage & Supply
  - 1.4 million barrels storage capacity
    - JP5
    - JP8
    - F-76
    - Low sulfur
    - Lube oil
  - 40 tanks
  - 85 miles of pipeline
  - War reserve
  - Supply Andersen Air Force Base: 1.6 million barrels storage capacity

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Market Assessment

3

3 Market Assessment

3.1 Regional Economics

3.1.1 General

Guam's ability to capitalize on the return of U.S. Navy-held properties at Apra Harbor depends largely on external market conditions, future revenue streams that such markets will generate, the degree of success Guam achieves in marketing itself, and whether Guam can integrate itself as an essential member of the increasingly important Pacific Basin economy. Guam, like most Pacific Island states, is virtually exclusively dependent on external economic forces. To continue its growth, Guam must define, establish, and secure its role within the larger regional economic sphere of Asia and the Pacific Basin.

Within the Pacific, its western core group of nations, the so-called Asia-Pacific region, has exhibited the fastest economic growth in history. The World Bank refers to the region's economic performance as the "East Asian Miracle." The region has experienced a truly dynamic growth rate for more than three decades. Today, the region claims the world's second and third largest economies—Japan and China.

This shift in the world's economic center of gravity is expected to accelerate into the next century, creating what some refer to as the 'Pacific Century.' During antiquity, the Mediterranean dominated world economics. Colonization of the Americas shifted the economic centroid to the Atlantic. More recently, the resurgence of the Japanese economy following the end of World War II, coupled with the emergence of the newly industrializing economies (NIEs) of South Korea, Taiwan, Hong Kong, and Singapore, have prompted some to postulate that the Pacific has replaced, or will imminently replace, the Atlantic.

World Bank figures appear to confirm the shift in economic dominance. The Bank projects that East Asian economies—Japan, China, Hong Kong, South Korea, Singapore, and Taiwan—will grow by 7.7% during the period from 1995 to 2004. In comparison, Latin America is expected to expand at a much smaller rate of 3.5%. Within the next decade, 55 to 60 percent of the world's total economic growth is expected to occur in East Asia alone.

The remainder of this Section provides an overview of the economic phenomenon of the Asia-Pacific region, postulates future trends, and explores implications for the economy of member sub-regions like Guam.

3 Market Assessment

3.1.2 The Asia-Pacific Economic Basin

While there is no definitive agreement as to the nations and states that comprise the so-called Asia-Pacific economic region, the term is commonly used to refer to those countries bordering on, or located within, the western core of the larger Pacific Basin. These nations include the economically developed countries—Japan, Australia, and New Zealand; NIEs—the Republic of Korea, Taiwan, and Hong Kong; the states of the ASEAN (Association of Southeast Asian Nations)—Indonesia, the Philippines, Thailand, Malaysia, Singapore, and Brunei; and the socialist economies—China, Vietnam, Cambodia, Laos, and the Democratic Republic of Korea. Sometimes, the eastern territories of the Commonwealth of Independent States, previously known as the Soviet Far East, are also included.

Guam is one of the microstates located in the Pacific Ocean. These microstates in Melanesia (Papua New Guinea and Fiji being the most populous), Micronesia (Guam, FSM, CNMI, Palau, and the Marshalls), and Polynesia (South Pacific entities such as French Polynesia and Samoa) are large in number, but small in size. Being small, the microstates are not all independent, some having retained historical allegiances to the U.S., New Zealand, France, and other European powers.

Although there is a high level of economic interdependence among the countries of the region, an expansion of the political, economic, and other links is expected to mature during the Pacific Century. Sustainment of regional development will depend heavily on the degree of consultations achieved and the promulgation of coordinated economic policies. Faced with the seeming emergence of major trading blocks in other parts of the world—the European Union (EU) and the North American Free Trade Agreement (NAFTA) to be specific—the Pacific nations are rightfully concerned of their competitiveness, notwithstanding the results of the December 1993, Uruguay Round of the General Agreement on Tariffs and Trade (GATT).

Because the Pacific Basin is far greater in population size, more diversified in terms of ethnicity and culture, and geographically dispersed, achieving closer economic links will be more difficult than in the case of the EU. One fundamental question is whether the region is making progress towards becoming a more unified economic entity.

3.1.3 Regional Economic Growth

With one or two exceptions, Asia and the Pacific is a poor, but rapidly-growing economy. It contains, in Japan, the world's second-biggest economy. In spite of Japan's having a population half that of the U.S., its gross output or gross domestic product (GDP) is

3 Market Assessment

about 60 percent of that of the U.S. Not more than 25 years ago, the U.S.'s output was more than seven times that of Japan. Apart from Japan, the small city states of Hong Kong and Singapore, Australia, and New Zealand, Asia and the Pacific consists of low and middle-income countries. Table 3.1 shows the region's gross national product (GNP) and growth rates in GNP.

Table 3.1
GNP and Growth in GNP
Sources: UNDP, World Bank

Country	1992 GNP ($ million)	1992 Per Capita GNP ($)	Growth in GNP per Capita 1965-80 (%)	Growth in GNP per Capita 1980-92 (%)
Japan	3,510	28,190	5.1	3.6
Hong Kong and Singapore	139	15,480	6.9	5.4
Australia and New Zealand	344	16,453	2.1	1.5
Low- and Middle-Income Countries				
China	546	470	4.1	7.6
Other East Asia	737	1,400	3.8	5.0
India	274	310	1.5	3.1
Other South Asia	91	310	1.2	3.0
Asia and Pacific (except N. Korea)	5,641	1,867	4.5*	4.1*
Rest of the World	17,634	7,294	1.7*	0.3*
Total World	23,275	4,280	2.4	1.2

* Estimate

The region contains a disproportionate share of the world's poor, most of them in South Asia. In the past, South Asia has had a poorer rate of growth than other economic regions in the area. Between 1965 and 1980, it averaged about 1.4 percent, whereas the whole of Asia and the Pacific averaged 4.5 percent. From 1980 to 1992, however, South Asia's growth rate has been far better, nearing that of the rest of the region, and recording growth rates 10 times greater than non-Asian locales.

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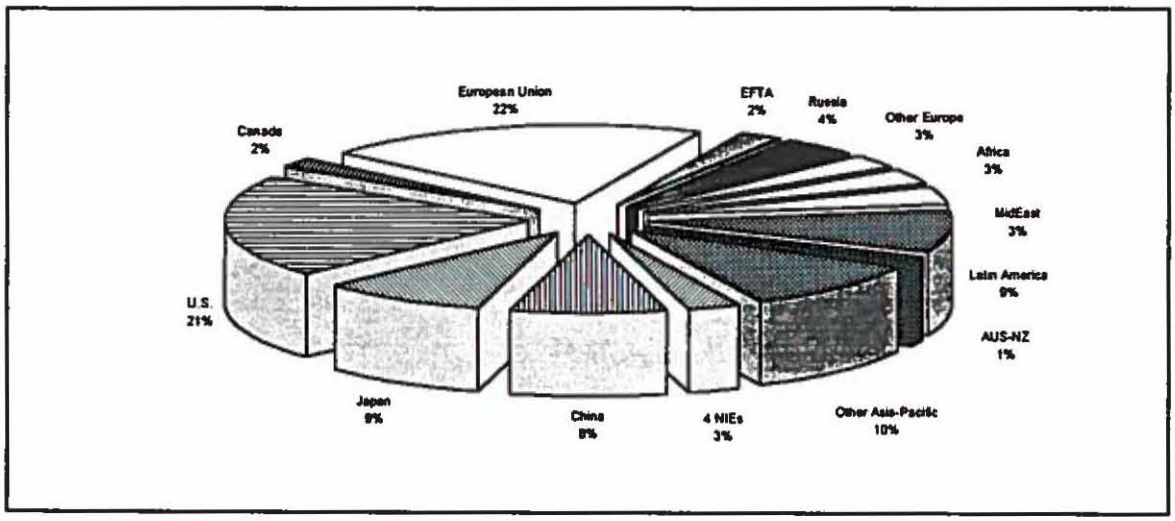
Table 3.1 also shows that between 1965 and 1980, the real GNP growth per capita for Asia and the Pacific was an estimated 4.5 percent annually, more than double the average for the rest of the world. Even more striking, however, is the growth record of the low- and middle-income countries in East Asia and the Pacific between 1980 and 1992. China's growth rate in those years exceeded 7.5 percent while other countries averaged close to 5 percent. These rapid rates of growth contrast with the negative growths being experienced in sub-Sahara Africa, Latin America, and the Caribbean.

Having experienced widespread dynamic growth for three decades, the total size of the Asia-Pacific region's output rivals, and by some measures exceeds, those of the United States and the European Union (EU). Figure 3.1 graphically portrays the world's gross products.

Figure 3.1
Gross World Product
Based on Purchasing Power



EFTA = European Free Trade Area
4 NIEs = South Korea, Hong Kong, Taiwan, and Singapore
Sources: The World Bank Atlas, 1995 and CIA World Factbook, 1994

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Other key economic factors include the following:

- Asia accounted for just 4 percent of the world's economic output in 1960. By 1993, the Asia-Pacific region's share was 32 percent of world output when measured on a Purchasing Power Parity (PPP) Basis.[1]

- Asia-Pacific output already far exceeds U.S. and EU totals, when measured on the basis of PPP.

- Developing Asia—Asia-Pacific countries less Japan, Australia, and New Zealand—has had a higher and more sustained economic growth rate than the U.S., Japan, and the EU over the past decade (See Figure 3.2 below).

- Japan, which experienced high growth rates into the 1990s exceeding those of the U.S. and EU, is now in a prolonged period of slow growth.

- China, which has averaged 9.5 percent annual growth over the last ten years,[2] is the world's fastest growing economy, and is the regions's focus for trade and investment.

- The four NIEs of South Korea, Taiwan, Hong Kong, and Singapore averaged an 8.3 percent growth rate during the 1980s and have exceeded 5 percent annual growth rates during the 1990s.[3]

- Southeast Asian countries are following the example of the NIEs and have experienced an average annual growth rate of 7.0 percent in the 1990s. The larger and poorer economies of South Asia have been progressing with a modest, but respectable, average growth rate of 4.4 percent over the same period.[4]

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[1] World Bank, *World Bank Atlas 1995*. The purchasing power parity basis converts foreign currency to U.S. dollars accounting for the buying power of a country's currency for those goods and services that are not transacted in the international trading system, but only trade in domestic markets. It is more cumbersome to calculate than the simpler Exchange Rate method, but accounts for a country's domestic purchasing power.

[2] International Monetary Fund (IMF), *World Economic Outlook*, May 1995, and Asian Development Bank (ADB), *ADB Annual Report, 1994*, April 1995.

[3] ADB, *Asian Development Outlook 1994*, Summer 1994.

[4] ADB, *ibid.*

- Despite Asia's overall dynamism, North Korea and Burma remain backward. They are endowed with natural resources, but are not performing well. Moreover, poverty is prevalent in Bangladesh, Cambodia, and Laos, who are among the poorest nations of the world with per capita incomes of less than $300.[5]

3.1.3.1 Japan. In terms of GDP, Japan is the second-largest economy in the world. Its GDP is equal to that of the United Kingdom, France and Germany combined. In the past 25 years, Japan's growth rate in GNP per head—4.1 percent—has been more than double that of the United States. In trade and investment, Japan dominates Asia and the Pacific.

A growing number of economists, who are concerned with problems generated by financial liberalization, believe that notwithstanding Japan's record of performance, its medium term growth will slow. They believe that much of the country's past economic success was due to the subordination of the financial sector to the industrial sector. Their concerns are based on such facts as the $25,000 million of bad debts held by Japan's seven top trust banks, mostly as a result of inadvisable real estate speculations and the collapse of the real estate market in the early 1990s. To counter slowing growth, in August 1992, and again in April 1993, the Government undertook various economic stimuli—mostly in the form of public sector investments—to prevent Japan's growth rate from declining below 1 percent.

While there are growing concerns, in the medium term, the prospects for continued growth are good, as Japan benefits from a strong currency-account balance, which in 1993 was equivalent to more than 3 percent of GNP, and an inflation rate of a little over 2 percent. Gross domestic investment in 1992 remained high at 31 percent of GDP, despite a small decrease from 33 percent in 1990.

3.1.3.2 China. Between 1980 and 1992, China showed remarkable economic performance as indicated by its 9.1 percent annual growth rate. The industrial growth rate was 11.1 percent, while the agricultural sector grew at more than 5 percent per year.

Towards the end of the 1980s, China's GDP growth slowed as an austerity program introduced in September 1988, reduced growth to 4.0 and 5.0 percent in 1989 and 1990. Despite these austerity measures, by 1993, GDP growth had risen again to approximately 13.5 percent for the year, a full percentage point higher than that achieved in 1992. Inflation, unfortunately, has also risen—by 1993 it had risen to 20% as compared to 18

[5] United States Pacific Command, *Asia-Pacific Economic Update*, Summer 1995.

percent in 1988 and 1989. It's "roaring tiger" economy doubling every eight years, is on-track to surpass the once-supreme U.S. machine sometime between 2008 and 2010. It's gross national product already has surpassed Japan's.

Reversing the trend of previous years, import growth outpaced exports in the first three quarters of 1993 by 23 percent, while the volume of overall trade increased by almost 20 percent over the same period. The importance of foreign trade has meant that the coastal provinces—Shandong, Jiangsu, Zhejiang, Fujian, and Guangdong—have grown particularly rapidly. The move to a more open economy has resulted in over 5,000 enterprises being authorized to trade directly with foreign companies, compared with only 10 official trading corporations in 1979. However, the reform of the large state-owned enterprises has been slow, and most of the industrial growth of the past decade has come from the private sector and from the semi-private township and village enterprises.

China's 1.2 billion people—more than the United States, Europe, and Russia combined—are quickly growing more affluent and demanding better, less monotonous diets. If China follow's America's consumerism, the rest of the world will not be able to satisfy its demands—prices of grain and oil will be phenomenal if the average Chinese consumed as much as an American. Dramatic changes are already occurring:

- Whereas China exported 500,000 barrels of oil per day in 1990, it now imports 300 million barrels a day
- By next year, 1997, the average Chinese is likely to eat more pork than the average American
- The Chinese consume more grain and red meat, use more fertilizer, produce more steel, and burn more coal than Americans according to the Worldwatch Institute
- Since 1994, China has gone from being a net exporter of about 8 million tons of grain to being a net importer of 16 million tons

The demand for more grains and fuel will challenge the entire world, placing heretofore unseen strains on world grain prices and the environment

3.1.3.3 Australia and New Zealand. The Australian economy was in a recession following two years of tight monetary policy. Its GDP fell in 1991 by about 2 percent, with manufacturing output down by more than 4 percent. In 1992 and 1993, however, there was some recovery as real GDP rose by 2.2 percent and 3.0 percent respectively. As a result, unemployment apparently peaked in 1992 at 11 percent, after rising from the

7 percent of 1990. Corporate losses and collapses, which had accompanied the recession of 1990-91, continued into 1992—Westpac Banking Corporation announced a loss of $1,670 million (Australian), Foster's Brewing Group lost $1,000 million (Australian), and BHP, the country's largest corporation reported a 60 percent decline in profits.

The New Zealand economy also recovered in 1992 and 1993, with GDP growing by 2.1 percent and 3.7 percent respectively. This compares with the 1 percent decline in 1991. Like Australia, unemployment peaked at 11 percent in 1992.

3.1.3.4 Newly-Industrializing Economies (NIEs). Sometimes referred to as the 'Four Little Tigers,' the Republic of Korea, Taiwan, Singapore, and Hong Kong, have demonstrated a singularly impressive growth record. So successful were they, that in the early 1980s, the World Bank claimed that these economies represented a model of how successful free market economies could be. Yet, the fact remains that these economies—in particular Korea and Taiwan—are tightly regulated and are not representative of the free market. The regulatory controls are so pervasive, that rather than serving as models of free market economies, these countries provide a model for what can be achieved through Government control.

Though growing somewhat more slowly than between 1965 and 1980, these NIEs have continued to demonstrate rapid growth. The growth of exports from Hong Kong has been particularly impressive, rising 20 percent in 1991. Rising real wage rates have encouraged the NIEs to relocate their labor-intensive industries to lower cost countries such as China, Malaysia, and Thailand. Accompanying the move, there has been a sharp increase in research and development expenditures, liberalization of some tariffs, and a diversification of exports away from the U.S. The U.S. share of the NIEs' exports (with the notable exception of Singapore) had fallen from over 40 percent in the mid-1980s to about one-third by the beginning of the 1990s.

In addition, the NIEs are diversifying their economies, moving away from manufacturing and into services. Singapore, for example, has offered attractive incentives to induce corporate relocations to Singapore. Both Korea and Taiwan have relaxed rules concerning foreign investments, especially for joint-venture, high-technology industries. Of the four NIEs, Hong Kong and Singapore remain the most advanced financially. Financial liberalization is progressing in Taiwan, but the same cannot be said of the rigidly-controlled situation in Korea.

Inflation for the NIEs as a whole remained at 10 percent per annum in 1992, the same rate as 1991. Hong Kong and Taiwan's rate have been slightly higher than the average at

about 12 percent. The 10 percent average is comparatively high for the region and reflects the tight labor markets caused by growth pressures.

Future growth will depend on the success of their restructuring initiatives. Korea, Singapore, and Taiwan could experience some slowdown in growth as a result of overall lags in world-trade. Hong Kong may be protected to some extent by its growing and strong links with China.

3.1.4 Trade

Economic relationships in the Pacific can be characterized first and foremost by the vigorous trade that occurs throughout the region. The Asia-Pacific region is America's largest and most important trading area. It accounted for 37 percent of total two-way merchandise trade in 1994, approximately double the 18 percent of total two-way merchandise trade that the U.S. experienced with the EU. U.S. trade with the Asia-Pacific region has exceeded its trade levels with the EU since 1979.

The Asia-Pacific region is America's largest customer for exports. According to the Department of Commerce, U.S. exports to Asia-Pacific were $156 billion, or 30 percent of the total U.S. export of $512 billion. Figure 3.3 shows the significant growth of U.S. merchandise exports with total exports to Asia-Pacific (including Japan) exceeding other regions.

Significant facts concerning U.S.-Asia trade include the following:

- After Canada, Japan is the largest purchaser of U.S. goods. In 1994, U.S. exports to Japan totaled $53 billion, more than to Germany, France, and the Netherlands combined.

- On a per capita basis, Japan imports $427 per citizen from the U.S., whereas the U.S. imports $457 per citizen from Japan.

- Developing Asia—Asia less Australia, New Zealand, and Japan—buys 70 percent more from the U.S. than Japan does. Since 1990, U.S. exports to Developing Asia has grown by 10 percent annually.

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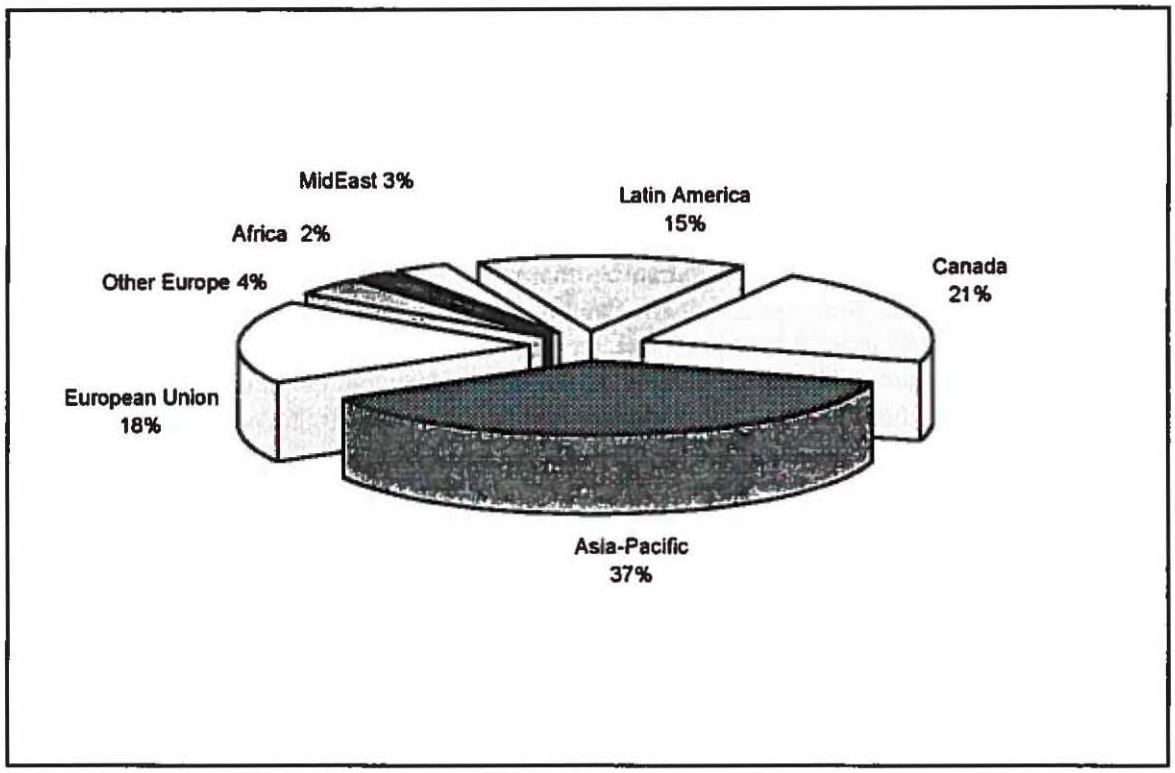
Figure 3.2
U.S. Two-Way Merchandise Trade
1994: $1,176 Billion



Source: Department of Commerce, cited by U.S. Pacific Command, Asia-Pacific Economic Update, Summer 1995

- After Canada, Japan is the larger seller to the U.S. In 1994, U.S. imports from Japan totaled $119 billion (versus $129 billion from Canada). Major imports include automobiles (33 percent of U.S. vehicle imports); electric machinery and electronics (21 percent of sector imports); power industry equipment (21 percent of sector imports); and toys, games, and sporting goods (19 percent of sector imports).

- U.S. imports from Developing Asia—$156 billion in 1994—have exceeded U.S. imports from Japan since 1980. Major imports include electric machinery and electronics; power industry equipment (reactors, boilers, machinery, and parts); toys, games, and sporting goods; and clothing.

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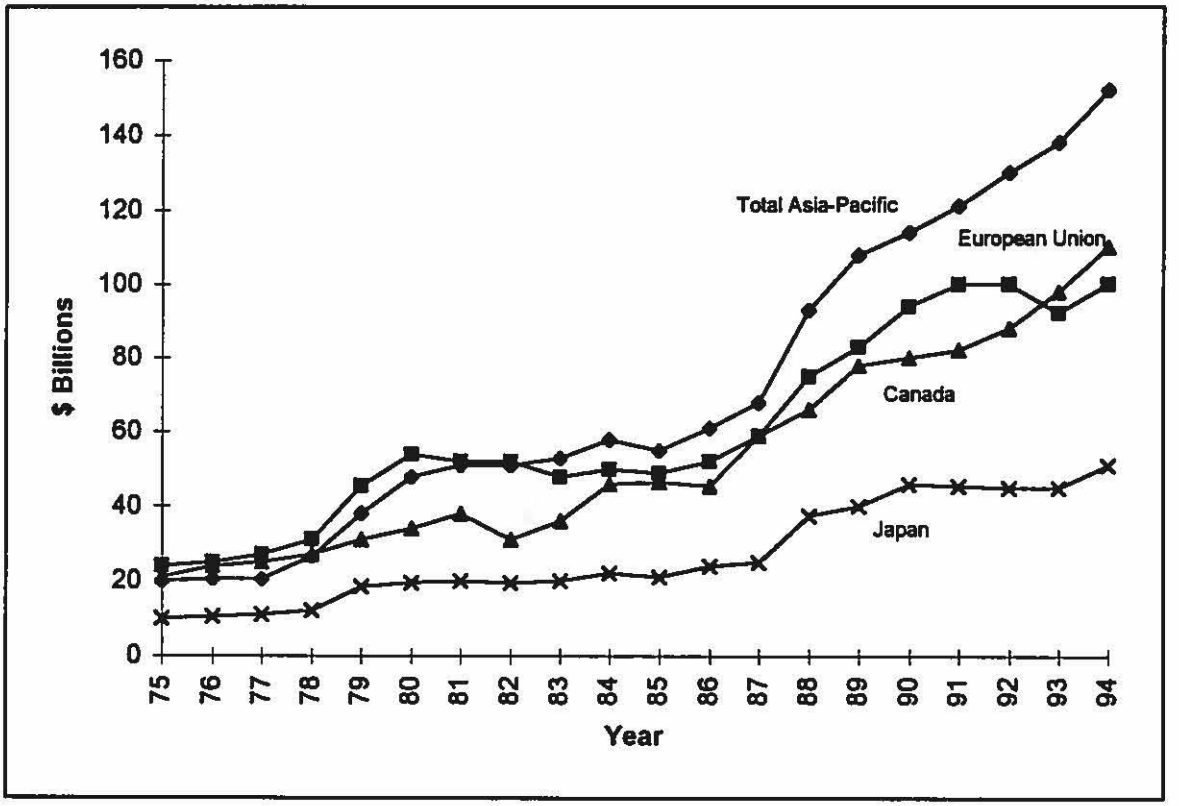
Figure 3.3
U.S. Merchandise Exports
Source: IMF and Dept of Commerce



- In terms of the volume of their trade with the world, both Japan and the NIEs rival the U.S. as global trading powers. In 1993, Japan exported $363 billion to the world; the NIEs, $378 billion; and the U.S., $465 billion.

- The growth of Asian trade continues despite weaker global trade. While the value of world trade experienced a 1 percent decline in 1993, exports from Developing Asia rose 10 percent, and exports from Japan increased 7 percent.

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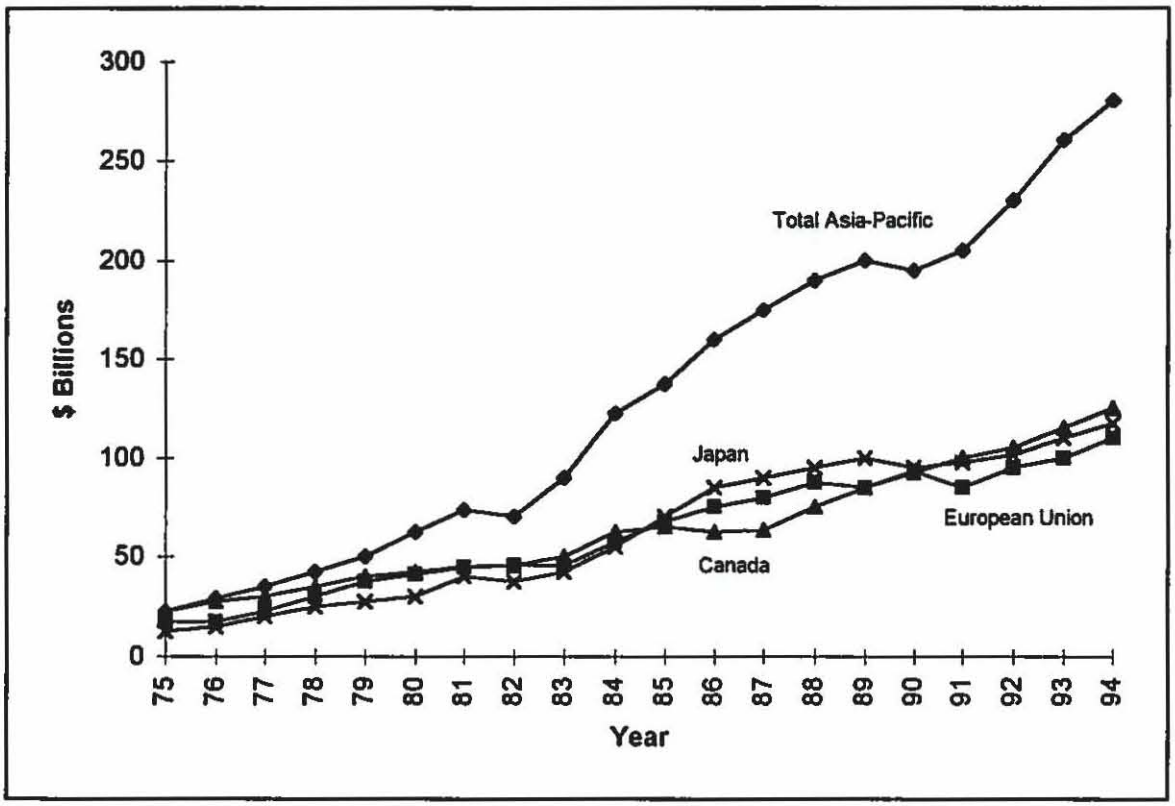
Figure 3.4
U.S. Merchandise Imports
Source: IMF and Dept of Commerce



- About 22% of Developing Asia's exports go to the U.S., 13 percent to Japan, 37 percent among its own countries, and 28 percent to the rest of the world. Japan is an important source for Developing Asia's imports.

- The fastest growing component of Developing Asia's trade is its intra-regional trade, with intra-regional exports growing from $59 billion in 1986 to about $240 billion in 1993.

As the Asian populations become more productive and affluent, trade opportunities for the U.S. and others are expected to increase. According to the Organization for Economic

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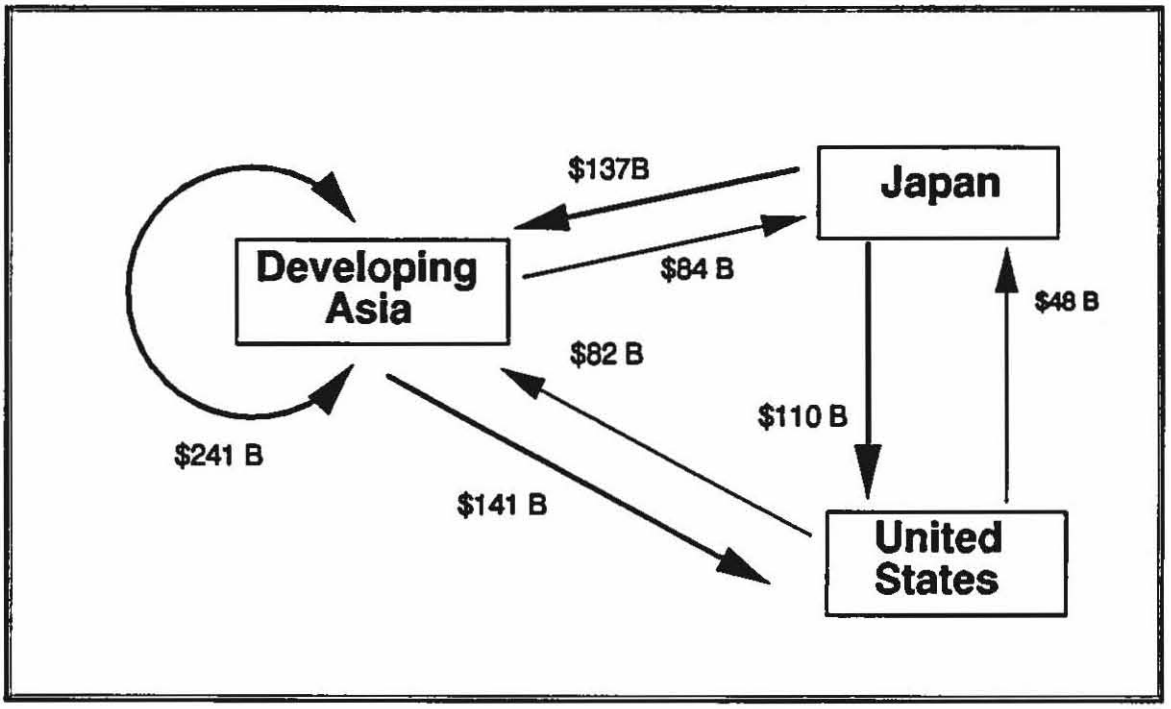
Cooperation and Development, Asia will account for almost a third of total global demand by the year 2010. By that year the 700 million people of China, Indonesia, and India are all projected to have average incomes equivalent to that of today's Spain. Such growth will have a significant impact on global economics, with Developing Asia competing aggressively in the manufactures trade and absorbing a much larger share of the world's investment funds. It will also result in a large export marked for non-Asian countries of the world.

Figure 3.5
Major Trade Flows
Source: U.S. Pacific Command, *Asia Pacific Economic Update*



3.1.5 Shipping and Commerce

The dynamic Asian economies are highly dependent on free passage along the shipping routes of the Asia-Pacific, especially through the shipping straits of Southeast Asia. The

area's shipping is characterized by long-distance, open-ocean transit combined with dense traffic along its coastal waters and narrow straits.

Imports typically include dry bulk goods, grain, coal, and iron ore from North America and oil from the Middle East. Exports from the region consist primarily of dry bulk goods. In 1992, the world shipped over 4,215 million metric tons (MMTs) in seaborne trade.

- Of total North American exports of 548 MMTs, 40 percent or 219 MMTs went to Asian countries. North America exported 42 percent of its dry bulk goods, 37 percent of its coal, and 46 percent of grain exports to Asia. In return, North America imported 13 percent of its dry goods, 29 percent of sugar, and 26 percent of its bauxite and aluminum imports from Asia-Pacific.

- Dry Bulk Cargo. In 1992, North America originated 30 percent of the world's dry cargo shipping, while Australia originated 28 percent. Japan received 28 percent of the world's dry goods shipping, and the rest of Asia received 23 percent.

- Grain. North America shipped 64 percent of the 208 MMTs in world seaborne grain trade in 1992. It shipped 25 MMTs to Japan, 27 MMTs to other Far East Asia countries, and 9 MMTs to Indian Ocean countries. Australia is a smaller grain shipper, sending 5 MMTs to Japan and Asia, 2 MMTs to Indian Ocean countries, and 2 MMTs to Africa.

- Iron Ore. Australia is the Asia-Pacific region's primary source of iron ore, shipping 48 percent of the 183 MMTs in total receipts by Japan and other Far East countries. In 1992, Australia exported 54 MMTs to Japan, 33 MMTs to other Far East countries, and 20 MMTs to Europe.

- Coal. North America and Australia are the predominant shippers of coal to the world, each shipping about one-third of the world's 371 MMTs in 1992. Major coal flows to Asia in 1992 were:

  - North America shipped 27 MMTs to Japan and 12 MMTs to other Far East countries

  - Australia shipped 61 MMTs to Japan and 27 MMTs to other Far East countries

  - China shipped 6 MMTs to Japan and 11 MMTs to other Far East countries

  - South Africa shipped 17 MMTs to Japan and other Far East countries

- Oil. In 1992, 375 MMTs of oil were transported from the Middle East to Japan and other Far East Asia countries (excluding China). Half of the tonnage went to Japan. Oil is also drilled in Southeast Asia—47 MMTs of this oil went to Japan in 1992. In 1994, Japan's total imports of crude oil, natural gas liquids, and refined products averaged 5.766 million barrels per day. Of this, the Persian Gulf supplied 65 percent, while Indonesia provided 10 percent.

Container traffic across the Pacific involves a number of routes, not all of which are evenly expanding. North American traffic—both eastbound and westbound container traffic—has become less consistent in volume from year to year when compared to Asian regional traffic. Eastbound container traffic declined by 3.3 percent in 1988 and then again by 12.7 percent in 1990. Its subsequent growth, except for the recovery of 14.5 percent in 1991, has been relatively modest. The industry outlook is for growth in this container traffic to rise an average of 6 percent of the balance of the current decade.

After its 12 percent rebound in 1994, growth in westbound container movements has slowed to an annual rate of under 6 percent and is expected to remain slightly lower than the eastbound volume for the rest of the decade. East-west traffic volume with Asia's NIEs, however, was proven an exception in 1995. As reported by the NIEs themselves, container flows from the U.S. rose an estimated 22 percent and could continue to grow significantly faster than the balance of westbound volume in the near term. This suggests that other segments of the westbound traffic may be quite low if the 6 percent growth proves correct for the whole.

In contrast to the east-west traffic, container volume is rising at very high rates in the north-south and intra-Asian routes. The intra-Asian routes in particular should remain the fastest growing in the world for the next several decades. At present, the intra-Asian volume is likely to rise by more than 16 percent in 1995 to exceed 5.5 million TEUs (Twenty-Foot Equivalent Units [of containers]). The forecast for the balance of the decade is an annual average growth of over 10.5 percent that will raise that market's total volume of containers to over 9 million TEUs.

High trade volumes have resulted in a significant growth in shipping facilities throughout the Asia-Pacific region. Within the region, Singapore and Hong Kong are the largest ports. Other major ports are being upgraded—Manila, for example experienced four times the volume in 1993 as it had in 1988.

- Singapore, the world's busiest harbor in terms of ship visits, over 92,000 in 1993 and gross tonnage at 623 million tons, vies with Hong Kong in claiming the most

container traffic in the world at near 12 million TEUs. The Port Authority plans to double that capacity in the coming years through a four-phased land reclamation and computerized terminal installation process. The expansion will add 300 more cranes to supplement their existing 400 quay and yard cranes, and is expected to increase ship entry to over 150,000 per year. Automation of container handling is to be a central aspect of the harbor expansion. Reduction of manpower is expected to keep the cost per container competitive with Hong Kong where the labor component should remain quite high.

- In 1994, Hong Kong processed over 11 million twenty-foot equivalent units (TEUs) of containers—the world's highest. Its container shipping operation, however, contrasts dramatically from that of Singapore's in a number of ways. One of the most important is that the government of Hong Kong has virtually nothing to do with the ultimate design or operation of the port in direct opposition to Singapore. After auctioning water front for the construction of shipping berths, the harbor's land reclamation and development is financed and designed entirely by private companies to meet their needs. In this fashion, the Port Development Board facilitates harbor development only as the market will support it, without any taxpayer subsidy but with considerable net revenue to the government.

- Taiwan sees the rise of shipping alliances as a prelude to the expansion of its Kaohsiung harbor. Today, Kaohsiung and Keelung harbors together handle over 7 million TEUs annually. Taiwan claims that Kaohsiung alone will be able to match Singapore's 12 million TEUs after planned expansions are completed. Kaohsiung envisions its role to be the transshipment point for freight sailing from China's east coast on small coastal vessels seeking consolidation and forwarding via large ocean-going ships. The latter need not be *Very Large Carriers (VLCs)*—6,000 TEU capacity and greater—to justify their plan. however, if VLCs materialize, there are few other ports that can accept them. Most that can—Pusan, Incheon, and Kobe—and are located to handle the east China freight, are already crowded, and would be unable to take on large increases in export that the late-developing regions of China are expected to produce.

  Kaohsiung's full expansion depends largely upon reconciliation between Taiwan and China. Until a political resolution is found, private and public efforts to expand the harbor will remain relatively modest. As it is not clear whether shipping alliances or whether VLCs will be introduced, or whether they will survive, Kaohsiung's development is uncertain.

- Other major ports are also being upgraded—Manila, for example, experienced four times the volume in 1993 as it did in 1988.

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Demand on container yards within the Asian market is rising rapidly and is expected to continue doing so for the indefinite future. The current inadequacy of port facilities has become a matter of acute concern and has prompted the UN's Economic and Social Commission for Asia and the pacific to call for up to $2.3 billion in construction of container berths throughout the region. Hong Kong's container traffic growth of 16 to 30 percent over the first half of the decade and Singapore's similar rise is already creating severe bottlenecks that will worsen in the coming years.

In response, ports at Penang and Klang in Malaysia are being improved, a new port is being constructed at Laem Chabang in Thailand, a new facility is under planning for Batam Island in Indonesia, and expansions plans are underway for the east coast of China; Ho Chi Minh City, Vietnam; and Subic Bay in the Philippines. But, the rate at which these ports will relieve the congestion is in question. As a result, more remote ports, such as Apra Harbor in Guam, could become candidates for handling some of the container loads.

Although Guam is geographically removed from the sea lanes between major markets, in light of the extraordinary dynamics emerging in the Asian markets, it is possible that new routing patterns of importance could be created. To be attractive, Guam would be required to create the market, most importantly by ensuring heavy concurrent use by a number of cargo carriers, if additional international transshipment of significant quantities is to be expected. For Guam to be able to induce the privately funded harbor investments, the mass of allied or synchronized traffic of containers that it must secure and guarantee would, as a minimum approach 2.5 million TEUs per year.

3.1.6 Summary

Individually, Pacific Basin nations have much the same kinds of economic, political, social, and environmental concerns as those in other parts of the world. Collectively, however, they ride the crest of an economic wave. Those with boom economies want to consolidate and sustain their rise up the economic ladder; the slow-growing, but economically-developed nations want to link in to assist their restructuring programs and bolster their economic fortunes; while the poorer developing ones are looking to the benefits which should come from prosperous neighbors.

The majority of the Asian-Pacific countries within the Pacific Basin are still far from affluent, with most containing large numbers of very poor people living in squalor in cities and villages.

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Economic growth and closer economic unity within the Pacific Basin have so far taken place without the kind of institutional support in place in Europe. Some Asian countries are unilaterally implementing trade liberalization and market opening measures. For example, the Philippines, Thailand, and Indonesia are establishing their own tariff reduction schedules. India has reduced tariffs, relaxed investment restrictions, and, for the first time, agreed to open its textile market.

However, a number of governments have seen the need for a supportive institutional structure which could aid economic development. Although there have been few active government organizations for the whole of the Pacific Basin, there are many formal inter-governmental agreements and groupings that are intended to foster regional integration. The openness of the global trading system upon which Asian economies are so highly dependent has led to increased reliance on multilateral trade institutions. The most important of these include the following:

- Asia Pacific Economic Cooperation (APEC) Group. APEC is an organization of 18 economies on both sides of the Pacific that seeks to sustain economic development through cooperation on trade and other economic issues. Member nations include Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore, Taiwan, Thailand, U.S., Mexico, and Papua New Guinea.

- World Trade Organization (WTO) and the General Agreement of Tariffs and Trade (GATT). GATT is a multilateral treaty that sets the rules for international trade and provides a forum for trade negotiations. It's administrative structures were replaced by the WTO when the Uruguay Round of negotiations were implemented in June 1995. 117 nations currently belong to the WTO.

- Asian Development Bank (ADB). Established in 1966, the ADB is an official, international organization that promotes economic and social development through development assistance and project loans. ADB members include Australia, Bhutan, Burma, Cambodia, Canada, China, Cook Islands, Fiji, Hong Kong, India, Indonesia, Japan, Kiribati, South Korea, Laos, Malaysia, Maldives, Marshall Islands, FSM, Mongolia, Nauru, Nepal, New Zealand, Pakistan, PNG, Philippines, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Tonga, Tuvalu, the United States, Vanuatu, Vietnam, and Western Samoa.

- Economic and Social Commission for Asia and the Pacific (ESCAP). The United Nations' ESCAP is a commission to promote economic development by providing analysis, interpretation of events, and technical assistance. Its members include Australia, Bangladesh, Bhutan, Brunei, Burma, Cambodia, China, Fiji, India,

Indonesia, Japan, Kiribati, North Korea, South Korea, Laos, Malaysia, Maldives, Marshall Islands, FSM, Mongolia, Nauru, Nepal, New Zealand, Pakistan, PNG, Philippines, Singapore, Solomon Islands, Sri Lanka, Thailand, Tonga, Tuvalu, United States, Vanuatu, Vietnam, and Western Samoa. Guam is an associate member.

- Pacific Economic Cooperation Conference (PECC). PECC is a non-governmental organization established to promote economic cooperation in the Pacific Basin based on free and open exchanges among businessmen, government officials, and academics in a spirit of partnership, fairness, and mutual respect. Members include representatives from Australia, Brunei, Canada, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore, Taiwan, Thailand, the United States, and the South Pacific Forum. Vietnam is an associate member.

- Pacific Basin Economic Council (PBEC), The PBEC is an association of business leaders from throughout the Pacific that promotes the expansion of trade and investment through open markets. Its membership includes over 900 member companies in Australia, Canada, Fiji, Hong Kong, Japan, South Korea, Malaysia, New Zealand, Philippines, Taiwan, and the United States.

- Pacific Trade and Development Conference (PACTAD). PACTAD is a non-government organization that provides a forum for East Asian, Australian, and U.S. economists to discuss trade and development issues.

- North American Free Trade Agreement (NAFTA). NAFTA is an agreement among the United States, Canada, and Mexico that creates a free trade zone in North America.

- Association of SouthEast Asian Nations (ASEAN). Established in 1976 under the Treaty of Amity and Cooperation in Southeast Asia (the "Bali Treaty"), the original signatories were Thailand, Singapore, Malaysia, Indonesia, and the Philippines. Brunei and Vietnam joined later. It serves as an umbrella organization for, among others:

  - Post-Ministerial Conference (PMC) focuses on economic issues annually.

  - Bilateral relations, e.g., U.S.-ASEAN Alliance for Mutual Growth (AMG)

  - ASEAN Free Trade Agreement (AFTA). The agreement calls for a goal of reducing tariffs to a maximum of 5% over a 15 year period from 1992.

- East Asia Economic Caucus (EAEC). EAEC was proposed as a possible forum with the intention of bringing together Asia-Pacific nations, including Japan, but excluding the U.S., Canada, Australia, and New Zealand. The forum was originally intended as an Asian reaction to the slow progress in GATT, and to the perceived protectionist measures of NAFTA and EU.

The trend towards an increased economic integration within the region is, on balance, having a significant, favorable impact. Asian-Pacific governments will need to concentrate more effort on social and spatial economic redistribution, on political liberalization, and on overcoming environmental problems. These are important to ensuring that the benefits of economic growth are equitably distributed.

In general, the prospects for continued economic growth in Asia and the Pacific are good. The prospects and rate of growth will depend to a large extent on the extent of diversion of world trade and aid into Eastern Europe, and also on the extent to which the nations in the region can capitalize on the so-called 'peace dividend.' The latter's impact is not insignificant as the UNDP has estimated that a reduction of just 3 percent per year in South Asia's military expenditure would free an additional $550 million per year for human resource investments. If that level of reduction could be accomplished throughout Asia and the Pacific, there would be a significant impact on the two-thirds of the world's 1,000 million poor who live in the region.

3.2 Micronesia

3.2.1 General

More than two thousand, tiny, tropical islands scattered over three million square miles of the Pacific in four large island groups constitute Micronesia—The Marianas Archipelago which includes Guam and the Northern Marianas; The Caroline Islands and the states of the Federated States of Micronesia; The Republic of Palau; and the Marshall Islands. Only 125 of the 2,000 islands, the largest being Guam, are inhabited. The islands are a mix of "high" volcanic islands—Agrihan in the Northern Marianas having the highest point at 3,000 feet elevation—and "low" sand and coral atolls—Kwajalein being the world's largest atoll covering 1,000 square miles. The vast majority of the islands are of the latter atoll type.

The Northern Marianas, Palau, the Marshalls, and the Caroline Islands were grouped into the Trust Territory of the Pacific Islands (TTPI) by the United Nations in 1947. Under the terms of the Trusteeship Agreement with the UN Security Council, the United States exercised administrative jurisdiction over the four island groups. Initially, the U.S. acted

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as the executive agent for the U.S. government, but the responsibility was transferred to the Department of Interior in 1951.

The Northern Marianas became a U.S. Commonwealth in 1976. In 1986, the Republic of the Marshall Islands and the Federated States of Micronesia became sovereign states in free association with the United States. Similarly, the Republic of Palau became a sovereign nation on October 1, 1994, under a Compact of Free Association with the United States until the year 2044.

Figure 3.6 A Comparative View of Micronesia

Master plans for the Port Authority of Guam have discussed the prospects for increased trade between Guam and Micronesia, as well as the potential for Guam to become a transshipment center for goods destined for Micronesia from Asia and North America. The implications could be significant to Guam and its economy. While the islands are sparsely populated and many have some ways to go before becoming fully "developed," their reliance on imports for all but the most basic subsistence items holds considerable possibilities for an active role by Guam in their future. Table 3.2 summarizes economic fundamentals for the island states of Micronesia.

This section provides a general economic overview of the three most significant to the future development of Guam and Apra Harbor. These three are the Commonwealth of the Northern Marianas Islands (CNMI), the Federated States of Micronesia (FSM), and the Republic of Palau. The Republic of the Marshall Islands (RMI), while part of Micronesia, is much closer to Hawaii geographically, and hence is allied closer to the 50th State than with Guam in terms of economics, shipping access, and air travel lanes. Guam's economic outlook will be discussed separately in Section 3.3 of this study.

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Table 3.2
Pacific Island Economies

	Population	Land Area Sq. Miles	GDP $US million	Per Capita GDP $US
Guam	149,249	212.0	3,128.0	20,958
CNMI	52,900	177.0	512.0	9,906
Republic of Palau	16,386	170.0	89.1	5,750
FSM	114,000	270.0	286.8	2,516
Marshall Islands	51,000	70.0	98.0	1,922
Total/Average	383,535	899.0	4,126.0	10,758

Source: Bank of Hawaii

3.2.2 Commonwealth of the Northern Mariana Islands (CNMI)

3.2.2.1 Background. Located between Guam and the Tropic of Cancer, the CNMI is a 226-mile archipelago consisting of 14 islands with a total land area of 176.5 miles. Only five of the islands are inhabited. It lies 3,700 miles west of Honolulu, 125 miles north of Guam, and virtually equidistant from Tokyo, Taiwan, and Manila being 1,300, 1,400, and 1,500 miles distant respectively.

The Northern Marianas were sparsely inhabited when Ferdinand Magellan reached nearby Guam in 1521 during his circumnavigation attempt of the world. Spain took possession of the archipelago in 1565, named it after Maria Anna of Austria (the widow of Spain's Philip IV) in 1568, and ruled it for over 300 years until 1898. Spain sold the islands to Germany following the Spanish-American War.

During World War I, Japan took control of the islands on behalf of the Allied Powers, then became their administrator under a League of Nations mandate in 1920. The end of World War II brought the islands under U.S. control as part of the UN's Trust Territory of the Pacific Islands.

In 1976, Congress approved the *Covenant to Establish a Commonwealth of the Northern Mariana Islands (CNMI) in Political Union with the United States*. The CNMI government adopted its own constitution in 1976, the constitutional government took office in 1978, and the Covenant was fully implemented on November 3, 1986, pursuant to Presidential Proclamation No. 5564.

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Under the Covenant, Federal laws generally apply with certain exceptions. The most notable of these are: (1) CNMI is not within the customs territory of the U.S., (2) Federal minimum wage provisions do not apply, (3) Federal immigration laws do not apply, and (4) CNMI can establish its own tax laws. In addition, special economic provisions such as duty-free export of goods assembled in CNMI to the United States give the CNMI a substantial comparative economic advantage.

3.2.2.2 Economy. Upon achieving Commonwealth status, CNMI opened its door to foreign capital and labor which have transformed the small island territory from an economy supported largely by subsistence and the government into a garment manufacturing haven and into a major tourist destination. Table 3.3 summarizes CNMI's gross business receipt data.

Table 3.3
CNMI: Gross Business Revenues
($000)

	1990	1991	1992	92/91 % Change
Agriculture, fishing	913.5	6,649.4	1,457.2	-78.1
Air transportation	3,814.6	6,099.5	2,626.4	-56.9
Banking	20,495.4	14,626.9	10,091.5	-31.0
Construction	80,036.9	125,621.8	105,891.4	-15.7
Garment manufacturing	162,541.3	263,429.2	272,796.4	3.6
Other manufacturing	9,485.5	8,362.5	5,706.3	-31.8
Hotels/Motels	87,812.0	93,932.0	117,462.5	25.1
Restaurants/Bars	29,896.3	36,154.7	38,101.7	5.4
Retail trade	162,103.6	264,191.9	283,141.3	7.2
Wholesale trade	72,331.8	81,771.6	103,286.2	26.3
Shipping	7,142.1	10,342.7	10,807.8	4.5
Professional services	29,438.9	36,057.8	34,626.8	-4.0
Petroleum	14,146.7	12,824.4	13,494.3	5.2
Land lease	134,202.5	71,079.7	16,078.8	-77.4
Transportation services	29,036.2	9,427.6	10,899.3	15.6
Gas service stations	6,365.4	8,863.3	10,674.8	20.4
Freight forwards	1,310.4	3,173.5	2,171.9	-31.6
Other	328,863.7	441,827.9	396,382.2	-10.3
Totals:	1,179,936.9	1,494,446.3	1,435,696.8	-3.9

Source: Bank of Hawaii

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By 1990 CNMI's gross business receipts had reached $1.2 billion, up 494 percent from 1980, generated by 3,550 business firms as compared to 598 a decade earlier. Total visitor arrivals to CNMI increased from 117,149 in 1980 to 417,146 in 1990, raising the daily tourist population from 1,123 to 3,911. Hotel room inventory increased from 740 to 2,931. CNMI's population exploded from 16,780 in 1980 to 43,345 in 1990. Most of the population gains resulted from an influx of foreign laborers who worked in both the rapidly growing visitor industry and in garment manufacturing. By 1992 the population was estimated to be 52,900.

Garment Manufacturing. CNMI's ability to make its own labor laws, in conjunction with duty-free export privileges to the U.S. gives it a major comparative advantage in producing goods for export to America. A part of this advantage has been in manufacturing garments for U.S. markets. Although the data is incomplete, the total export value of garments was an estimated $319.2 million in 1994. While lower than the total export value equivalent of tourism—estimated at $463.5 million in 1994—garments are the only other major source of income in CNMI. In 1992 the industry reported a total employment of 5,977, of which U.S. and CNMI citizens numbered 229, Micronesians 691, and foreign (primarily Asian) workers 5,057. The industry's total direct and indirect payments to the economy was an estimated $100.4 million of which $23.5 million went to the CNMI government. Information from the Saipan Garment Manufacturers Association (SGMA) in the summer of 1995 largely corroborates the 1992 survey data. The SGMA data shows the industry's current level of employment to be nearly 7,000 of which 1,100 were CNMI residents.

Growth of the garment industry is not as certain as the rise expected in tourism in the next 5 to 10 years. Although CNMI pursues a neutral economic development policy, it tacitly encourages tourism growth more than garment and other light manufacturing. Part of the reason is the burden a large foreign worker population places on the Commonwealth's fragile infrastructure. At the same time CNMI labor practices have raised concerns, in particular the treatment of foreign workers and illegal entry of foreign workers into the United States. While CNMI enjoyed rapid expansion of light manufacturing in the 1980s, growth is not likely to continue at the same pace.

Tourism. A large part of CNMI's comparative advantage, its capacity to provide a taste of American life, has been translated into a growing tourist industry. Tourism is CNMI's largest income source and its most dynamic industry. As in Guam, tourism offers CNMI the greatest potential for the future primarily because of its proximity to industrial East Asia.

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Tourist traffic has increased every year since 1985 except for a small 1.3 percent drop in 1991. In 1994, total arrivals rose 9.2 percent to a record 596,033. Tourists showing the greatest gain in 1994 were from CNMI's second largest and most rapidly growing market, Korea, whose number rose 68 percent to 102,275, representing 17 percent of the total. Tourists from Japan, CNMI's largest market rose only 2.2 percent to 387,210.

In 1995, total tourist traffic continued to rise at a healthy pace. Total arrivals were up 14 percent in the January to July period with Japanese arrivals increasing only 5 percent. Consistent with earlier years, arrivals from Korea were up about 45 percent in the first 7 months.

Fish Transshipment. Tuna operations in CNMI began with no processing operations, shore facilities, fuel, or provisioning services. Tinian, one of the major islands in the Commonwealth, became a transshipment center for cannery-grade frozen tuna in the early 1980s with fishing vessels off-loading directly onto reefer vessels bound for American Samoa, Puerto Rico, and Asian processing centers. Limited shore facilities were developed and the use of Tinian gradually expanded until the early 1990s. 1991 saw the start of air transshipment of fresh, sashimi-grade tuna to Japan—of tuna caught in the FSM and air-freighted to Saipan.

Use of the Tinian transshipment facility, however, has been steadily declining since 1991. At its peak, Tinian was supported chiefly by American Seiners (especially "Z" boats owned by the Zuanich family) and by Taiwanese seiners. In recent years use by both groups have declined dramatically.

Table 3.4
Tuna Volume and Vessel Calls at Tinian
Source: Pacific Basin Development Council

Year	"Z" Boats	Others	Tonnage
1989			52,821
1990			64,353
1991			72,405
1992	32	46	46,505
1993	20	24	22,215
1994	2	25	19,782

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The precipitous decline has its roots in Zuanich's pending move to supply a new tuna cannery in Papua New Guinea (PNG). That, combined with the newly established Casamar/APL venture in Guam, served to accelerate Tinian's decline. The future of the Tinian transshipment facility will likely depend on:

- Whether Taiwanese vessels continue to use the port in significant numbers
- Whether the Zuanich fleet of purse seiners is deployed to PNG
- The comparative economics of the newly established Casamar/APL container operation in Guam

Saipan has also emerged as an air cargo hub for sashimi grade tuna. The operation is relatively small at this time and its future is uncertain. It appears unlikely that the CNMI government can increase the economic benefits of the relatively new industry without running the risk of driving it away. Any increase in landing fees or jet fuel tax or the imposition of some form of transfer tax would probably make it more profitable for shippers to find an alternative means of air freighting the fish to Japan, e.g., through Guam. Air freight charges out of Guam were $.30 to $.37 per kilogram higher than in Saipan, but most shippers were willing to pay the differential because the flight schedules were more compatible with market requirements in Japan. Unless other costs in Saipan are significantly less than Guam, it seems likely that shippers will totally leave Saipan if taxes were added.

3.2.2.3 Economic Outlook. CNMI's secondary and growing sources of income are trade and services. Wholesale and retail trade, government and business services, medical and educational services, and transportation and communication services all contribute to the economy. Fishing and agriculture remain small, mostly subsistence in nature.

As CNMI tourism and light manufacturing expand over the next 5-10 years, all secondary service areas, including retail and wholesale trades will grow with them. As the economy develops over the next decade, albeit at a slower pace than the frantic rate of the 1980s, it will generate more jobs and elevate CNMI's standard of living. Some particular prospects include:

- Hotel/Golf course destination resort construction
- Duty free and other retail shops to meet the appetite for tourist gifts
- Big-box retailers for local consumption needs
- Infrastructure expansions (in particular the air terminal)

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3.2.3 Federated States of Micronesia (FSM)

3.2.3.1 Background. The FSM is a chain of 607 small islands about 2,500 miles west of Hawaii. Within its borders are all of the Caroline Islands, except for Palau. Its total land area amounts to only 270.8 square miles scattered over more than one million square miles of the Pacific, extending 1,800 miles from the east (Kosrae) to the west (Yap). The 130 square mile Island of Pohnpei is the largest in the FSM and its capital.

Administratively, FSM is divided into four states: Pohnpei (formerly Ponape), Chuuk (formerly Truk), Yap, and Kosrae. Pohnpei includes the Island of Pohnpei, 25 smaller islands and another 137 widely scattered coral reefs, and in 1991 had a population of 34,228. Chuuk State, with its 49.2 square miles of land, consists of seven major island groups with its capital located on Moen, the state's largest island. Moen and the state's other 98 islands are surrounded by a coral reef ring that forms the Chuuk Lagoon, the site of some of the fiercest battles of World War II. In 1991, Chuuk had a total population of 50,491, almost half of FSM's total population of 103,251. Yap, with a total land mass of 45.6 square miles, is made up of four large and seven small islands and another 134 islets. Its population in 1991 was 11,019. Kosrae consists of five closely situated islands with a total land area of 42.3 square miles and had a population of 7,513 in 1991.

Historically, the Portuguese were the first Europeans to visit the FSM, having come upon Yap and Ulithi in 1525 as they searched for the famed "Spice Islands," Indonesia. Beginning in the mid-16th century, Spanish explorers surveyed the Caroline Islands—named for Charles II, King of Spain. Spanish sovereignty lasted until 1899, when the islands were sold to Germany following the Spanish-American War. Japan captured most of the Western Pacific from Germany in 1914 as it fought with the Allied Powers. German occupation ended with the end of World War I, when the League of Nations gave formal approval to Japanese administration of the islands. At the height of the Japanese rule, over 100,000 permanent Japanese resident lived throughout FSM, compared to the estimated indigenous population of 40,000. Sugar cane, mining, fishing, and tropical agriculture became the islands' major industries.

The United States assumed UN trusteeship of FSM—along with CNMI, Palau, and the Marshall Islands—after World War II as part of the Trust Territory of the Pacific Islands. Following years of negotiations, the Federated States entered into a Compact of Free Association with the United States in 1982. The Compact was signed in 1985, and formally implemented on November 3, 1986. Under the Compact, the FSM is a fully autonomous, sovereign state, reserving defense rights for the United States and receiving substantial funding for government operations, construction, and development.

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3.2.3.2 Economy. For five decades now, FSM has been a consumption economy funded by the United States. It is principally a developing economy despite a well-established money economy and relatively high per capita income. Its per capita gross domestic product (GDP) is an estimated $2,000 per year which places it near the top of 45 world economies the World Bank classifies as "middle-income."

FSM's economy is structurally unique in some ways—in exchange for allowing the United States exclusive access to its waters, it receives a fixed rent from the U.S. By the terms of the Compact, the FSM will have received a total of $1.339 billion from 1986 through 2001. The U.S. funds have allowed the development of modern communications, transportation, and utilities, but those are limited to the population centers of the main islands. The economy's engine has remained the same: monies from the U.S., first as part of the U.S. TTPI, and later under the Compact.

Other than a garment manufacturing factory in Yap which employs 500 people, 2 soap factories and some pepper processing on Pohnpei, manufacturing in the traditional sense does not amount to much as a source of employment and income. Handicrafts, a shell button-making enterprise, and other small concerns have added to the manufacturing sector, but manufacturing is far from becoming a serious contender as an income source.

An area of improvement has been the increase in the production of fruits and vegetables, but cyclone damage in 1991 wiped out some of that gain, especially for pepper production and packaging on Pohnpei. Because of the high cost of imported inputs, the final cost of many homegrown vegetables and fruits in the open market is often higher than imports, even from long distance markets such as the United States. Production of the country's main cash crop, copra has suffered substantially over the years despite government subsidy because of low world market prices.

Tourist traffic has grown over the years but it does not generate income even remotely close to U.S. rent payment or aid. Major barriers to developing tourism have been FSM's distance from mass markets, the distances among small islands scattered in the ocean with scant means of transport and communication, and the insufficiency of infrastructure on the ground to satisfy the demands of increasingly sophisticated travelers to the region. The FSM is farther away than either Guam or CNMI from the industrial East Asian economies which supply virtually all of the tourists to Micronesia. Although tourist traffic tripled from 1984 to 1993, increasing from fewer than 10,000 to more than 30,000 visitors, that total was less than four percent of the 1993 tourist traffic to Guam. Visitor traffic to Pohnpei, the destination with the best facilities in the country, was up less than two percent in the first seven months of 1995. In fact, the islands hold many possibilities for specialty tourism, but with their attractions widely dispersed, none of the individual

islands is a likely candidate for mass market development. The Pacific's biggest and most dynamic export, tourism, has passed FSM by almost entirely.

3.2.3.3 Economic Outlook.

Agriculture. FSM is made up of small and isolated islands with little flat land suitable for the mass cultivation that would generate economies of scale for both production and distribution. Without the use of modern technology, which cannot be justified under the above land constraints, the prevailing method of agriculture is subsistence production. Physically and technologically, the conditions of the 1950s have changed little. The prospect of a commercial agricultural economy producing mass quantities for mass markets is no more likely today than it was in the 1950s.

Tourism. Because of its isolation and small market potential, the FSM is unlikely to benefit from the economic rebound in the region that is currently under way. About 75 percent of the tourists to Guam and 65 percent to CNMI are from Japan. As the Japanese economy recovers and prospers, tourist traffic from Japan is expected to rise accordingly in those areas. While proximity, good tourist infrastructure, and attractively-priced tour packages bring tourists from Japan to Guam and CNMI, only about 25 percent of the tourists to FSM are from Japan. A full 60 percent of FSM's tourists were from the U.S., one-third of them business travelers.

FSM's diversity of eco-systems and marine habitats appear to make it a suitable destination for one of tourism's current buzz words, Eco-tourism, but even that requires roads, water and sewer systems, hotels, restaurants, and shopping facilities. Thus, until there is a concerted effort to build the necessary infrastructure, FSM is unlikely to participate in the region's tourist-driven economic rebound.

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Table 3.5
FSM: Visitor Arrivals

	Chuuk	Kosrae	Pohnpei	Yap	Total
1984	3,306	552	4,323	1,282	9,463
1985	4,684	577	5,119	1,475	11,855
1986	4,286	969	5,335	1,740	12,330
1987	4,914	1,308	5,273	1,938	13,433
1988	3,714	1,327	6,475	3,160	14,676
1989	6,923	1,763	7,518	3,901	20,105
1990	7,600	1,965	9,787	3,819	23,171

Source: Bank of Hawaii

Fishing and Fisheries. Both the FSM and its state governments have taken steps to encourage greater exploitation of the country's rich marine resources in its 200-mile Exclusive Economic Zone (EEZ). One direct result of increased access to the area's fishing habitats has been the rise in fees for fishing rights accruing to the FSM government. To support this strategy, FSM made the "local landing of tuna" a condition of fishing licenses for longline tuna vessels. The immediate impact of the license conditions was reflected by the growing number of tuna longliners landing fresh fish in the various FSM ports.

Table 3.6
Airfreight Tuna Shipments (kg) and Longliner Port Calls
Source: Pacific Basin Development Council

Year	Shipments	Port Calls
1991	272,242	82
1992	2,076,316	516
1993	3,013,074	866
1994	8,458,198	2,366
1995	7,542,434	2,797

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Between 1991 and 1995 transshipped exports increased by a factor of 27, while vessel port calls by longliners increased a staggering 34 times. By any measure, the land locally policy was an incredible success, at least in terms of transshipment activity in the FSM.

FSM's fish supply is large and diverse enough to potentially justify some kind of fish processing plant in the FSM, especially in Chuuk which offers the largest labor market and suffers from chronic un- and under-employment. But, creating a fish processing center require even larger sums of capital than does tourism, and could be correspondingly more difficult—it will take a significant marketing effort to attract investment capital, whether from the U.S. or Asia.

Garment Manufacturing. Garment manufacturing and other light assembly of goods for sale in the U.S. is possible, as long as goods can be sold without import duty. The garment factory in Yap is a good example of such an activity. Other light assembly that uses indigenous labor and foreign capital to produce duty-free goods for sale in the U.S. may be viable.

Undersea Mining. A final potential area of income is undersea mining. The technology to exploit undersea mines while reducing the potential for environmental damage is being developed rapidly. Additionally, substantial progress has been made in finding uses for the residue once an undersea ore has been mined. As technologies develop making it possible, for instance, to convert tailings from manganese nodules into building industry products, the entire sea mining enterprise becomes increasingly promising.

3.2.4 Republic of Palau

3.2.4.1 Background. The islands of Palau are the eastern-most islands in the Caroline chain. The Republic consists of more than 200 islands, of which nine are inhabited. The nearest land masses are the Philippines (550 miles to the west), New Guinea (410 miles to the south), and Guam (815 miles northeast). Its total land mass is 170.4 square miles with Babeldaob, the largest island at 10 miles wide and 20 miles long, making up 80 percent of the total land area. A bridge links Babeldaob with the Island of Koror, seat of the national government and the largest urban area.

Western contact between the original settlers, who are believed to have come from Indonesia as early as 2500 B.C., occurred in 1783 when an English explorer, Captain

Henry Wilson shipwrecked near the islands. The British dominated trade with Palau until 1885 when Pope Leo XIII acknowledged Spain's claim to the Carolines. Together with the rest of the Caroline Islands (now FSM) and the Northern Marianas, Palau was sold to Germany in 1899 following Spain's defeat in the Spanish-American war. The Germans increased economic activity by introducing coconut planting and phosphate mining in Angaur. The Germans also introduced sanitation measures to combat epidemics of influenza and dysentery which had decimated Palau's population from 40,000 to 4,000 in 120 years.

Japan assumed control from Germany in 1914 and in 1920 received a League of Nations mandate for administration of the islands. During the Japanese rule, pineapple was introduced and the production of rice and other staples increased. The Japanese also increased phosphate mining efforts and commercial fishing.

Following World War II, Palau became part of the U.S. administered Trust Territory of the Pacific Islands (TTPI). After numerous attempts at self-determination and rule, Palauans voted on November 9, 1993 to end Palau's status as the only remnant of the TTPI, finally approving the Compact of Free Association with the U.S. which had been passed by Congress in 1986. On October 1, 1994, Palau became the last of the old TTPI entities to become a sovereign nation.

3.2.4.2 Economy. Palau's economic development, like that of other Micronesian states, is hindered by its small size, isolation, lack of skilled labor, poor physical and educational infrastructure, and an absence of abundant natural resources other than the ocean. At the same time, these same characteristics could be potential economic strengths, specifically in the further development of its tourism sector and the use of its marine resources.

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Table 3.7
GDP by Economic Activity
($000)

	1983	1990	1991	1992
Agriculture & Fishery				
Agriculture	3,080	2,296	2,496	2,647
Fishery	2,219	17,647	21,093	23,202
Total:	5,299	19,943	23,589	25,849
Industry				
Manufacturing	117	528	633	818
Construction	3,982	8,522	7,015	6,688
Electricity	594	NA	NA	NA
Utilities	NA	2,849	3,709	4,472
Total:	4,693	11,899	11,357	11,973
Services				
Trade	5,247	12,014	13,798	14,062
Hotel & Restaurant	539	6,258	6,802	8,717
Transport & Commerce	729	3,371	3,397	4,087
Finance & Insurance	549	3,112	3,175	3,271
Real Estate & Business	260	3,313	3,735	3,702
Government	11,651	14,212	15,024	14,356
Other	2,004	2,767	2,978	3,723
Total	20,979	45,046	48,909	51,918
GDP	30,971	76,888	83,855	89,740

Source: Bank of Hawaii

As is typical of the former trust territories, consumption and services have dominated economic life Palau. This, however, has begun to change, although not as much or as rapidly as a higher self-sustaining standard of living would ultimately require. Despite changes in its makeup, the services sector remains Palau's largest area of economic activity as seen in Table 3.7 and 3.8.

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Table 3.8
GDP by Economic Activity
(Percent Shares)

	1983	1990	1991	1992
Agriculture & Fishery				
Agriculture	9.9	3.0	3.0	2.9
Fishery	7.2	23.0	25.2	25.9
Total:	17.1	25.9	28.2	28.8
Industry				
Manufacturing	0.4	0.7	0.8	0.9
Construction	12.9	11.1	8.4	7.5
Electricity	1.9	NA	NA	NA
Utilities	NA	3.7	4.4	5.0
Total:	15.2	15.5	13.5	13.3
Services				
Trade	16.9	15.6	16.5	15.7
Hotel & Restaurant	1.7	8.1	8.1	9.7
Transport & Commerce	2.4	4.4	4.1	4.6
Finance & Insurance	1.8	4.0	3.8	3.6
Real Estate & Business	0.8	4.3	4.5	4.1
Government	37.6	18.5	17.9	16.0
Other	6.5	3.6	3.6	4.1
Total	67.7	58.6	58.3	57.9
GDP	100.0	100.0	100.0	100.0

Source: Bank of Hawaii

Even after a 10 percent decline in its share of national output from 1983 to 1992, services averaged nearly 60 percent of GDP in 1990-1992. Among the most notable changes was the drop in government services from nearly 38 percent of GDP in 1983 to less than half that in 1992, a drop in relative but not absolute size, as other sectors such as agriculture and fishery increased in relative importance to the economy.

In contrast, trade, the second largest segment of services, remained unchanged at about 16 percent of GDP over the decade. The rest of the services sector rose from 10 percent of GDP in 1983 to nearly 30 percent in 1992, with hotels and restaurants accounting for one-third of the increase as tourism's role in the economy increased.

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The most notable change from 1983 to 1992 was the rise in Palau's second largest sector, agriculture and fishery, in both absolute and relative terms. At current prices, agriculture and fishery increased nearly 390 percent from $5.3 million in 1983 to $25.8 million in 1992. Fishery alone made up the gain as it increased from $2.2 million in 1983 to $23.2 million in 1992. In relative terms, fishery rose from 7.2 percent of GDP in 1983 to 25.9 percent in 1992, while agriculture declined from 9.9 percent of GDP in 1983 to 2.9 percent.

Palau's third economic sector, a composite of industrial activities, declined slightly as a share of GDP from 15.2 percent in 1983 to 13.3 percent in 1992. Construction, which has varied widely from year to year, declined from nearly 13 percent of GDP in 1983 to 7.5 percent in 1992.

3.2.4.3 Economic Outlook.

Marine Resources and Fisheries. Palau's marine resources include inshore and offshore vertebrate species such as reef fish, pelagic fish, bottom fish, turtles, birds, crocodiles, and marine mammals. Invertebrate species include shrimp, clams, trochus, lobsters, pearl oysters, crabs, octopus, and corals. The coral reef ecosystem is widely recognized as one of the richest and most diverse in the world.

Fishing in the lagoons and out on the reef is both a means of subsistence and of generating money income. In 1993, fishermen landed a total of 769 tons of fish and invertebrates at three major fish markets with a dockside value of $2.1 million, not including aquarium fish, cultured giant clams, and trochus. Fishing for commercial button shell and trochus is a large source of seasonal income for local fisherman. In 1992, a total of 265.1 tons was landed, with a dockside value of $645,000. A total of 251.9 tons was exported to Asian markets, bringing $1.1 million into Palau.

Offshore fishing of pelagic species, particularly tuna, is conducted mostly by foreign commercial vessels. American and Japanese licensed vessels are not required of off-load their catches in Palau, while vessels from Taiwan and China are. Revenues from this source totaled about $1.2 million in 1993. The industry at present faces a number of issues:

- Fishery management and conservation policies cannot be executed to the fullest extent due to the lack of data. Several sources believe that reef fish harvests may have reached maximum sustainable yields.

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- Three big commercial traders serve foreign licensed vessels in transshipping their catches of tuna to Japan. Local people play limited roles in management positions, thereby limiting potential benefits to Palauans.

- Environmental degradation caused by congestion in the harbors and lack of sanitary facilities is become a major concern to the tourism industry.

- Off-shore and in-shore poaching by foreign vessels is a persistent problem.

- Expansion of fish exports is constrained by the lack of cargo space and connections to major markets such as Japan, Taiwan, and the United States.

Palau clearly has a great tourism potential, which translates directly into increased air cargo capacity. Because Palau sees tourism as the backbone of its future economic growth, it is devoting considerable resources to developing this sector. One logical step that the government is pursuing is to directly tap and Japanese and other Asian tourist markets through nonstop air links. The Palau government has initiated the planning and design of a major expansion of its international airport. When completed the facilities will facilitate the use of large wide-body jets—currently narrow-body Boeing 727 are the norm—with direct connections between Palau and Tokyo, Taipei, and Seoul. The facility, coupled with improved cargo handling facilities both at the harbor, would facilitate expansion of the fish transshipment business with interesting regional implications. It could eliminate the need to transship tuna caught in Palau waters through Guam. In addition, the quality and resultant value of Palau's sashimi exports could rise since transfer and holding times of the fish would be reduced.

Agriculture. A large proportion of Palau's soils are suited to the production of certain crops and livestock. However, only a small proportion of the available land is being used for agricultural production because of the lack of roads to these arable lands. Additionally, land ownership problems and the uncertainty they generate, constrain agricultural development. Land may be public, held in trust by the national government, owned by the state, owned by a clan, or privately owned. Clear title to land customarily does not exist.

Because of the character of the land and lack of roads for mechanization, farming is labor-intensive. To increase production, more labor is required than is presently available in rural areas, but the unemployed in the labor market are not inclined to accept low wage agricultural work. In addition, there is a perception that farming is woman's work, and has low esteem.

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At least part of the problem—an adequate road transportation network—is being addressed. As part of the Compact, the U.S. is funding a construction of a circumferential road on Babeldaob. When completed it should allow villages, currently accessible only by boats, to be networked with the markets of Koror.

Tourism. Palau has been regarded as one of the world's prime diving locations for a number of years. Its isolation has served to maintain its pristine qualities and singularity among destinations. The most recent data indicate that tourist and business arrivals reached a record 34,000 in 1993 out of a total of 40,497 visitor arrivals for the year. These numbers, which were up 13.3 and 12 percent over 1992, were three times the levels recorded in 1985. Palau became a viable tourist destination about the year 1985 when the Palau Pacific Resort, a major luxury hotel, opened its doors. Prior to that year tourist figures were essentially flat—approximately 5,000 per year.

Past predictions of growth in tourist/business arrivals have been only slightly optimistic. The 1987 forecast made on the basis of patterns leading up to 1985, anticipated a total of 30,000 in 1990, a level not reached until 1992. The actual increase translated into an average compounded rise of 13 percent per annum rather than the 18 percent that had been forecasted. The actual rate achieved is not unreasonable to assume for the short term if it is assumed that the increases would come in off-season arrivals who will utilize the available hotel rooms during periods of low occupancy. A greater number of hotel rooms would be required quickly if growth were to occur during the peak travel seasons.

In addition to hotel accommodations, other factors that could constrain tourism growth include:

- Insufficient infrastructure support systems. The existing utility systems are insufficient for even the resident population. Hence, the better resort properties are compelled to build and operate their own utilities.

- Transportation facilities require considerable development. In addition to the air terminal mentioned earlier, harbors need to be improved to support marine-related tour opportunities.

- Unclear foreign investment requirements have hindered the infusion of foreign capital in the past. Uncertainties over land titles and land-use rights have compounded development.

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- A substantial amount of concern exists over foreign ownership of Palauan properties as well as the potential infusion of foreign laborers to operate and manage tourist-related facilities.

In spite of these and other challenges, however, tourism remains the Republic's best comparative economic force in the near term and beyond. The demand for leisure travel worldwide, especially to unique destinations such as Palau, will certainly continue to grow over the long term. Palau is well place to participate in that growth, offering the country the opportunity for sustainable economic activity.

3.3 Guam

3.3.1 Introduction to Guam

Guam, an incorporated territory of the United States, is the largest and southernmost island in the Marianas Archipelago. The island is 30 miles long, ranges from 5 to 8.5 miles in width, and has a total land mass of 212 square miles. It lies 3,700 miles west-southwest of Honolulu, 1,600 miles east of Manila, 1, 500 miles south-southwest of Tokyo, and 3,500 miles north-northwest of Sydney.

Formed through an uplift of undersea volcanoes, Guam is composed of two distinct geologic areas of about equal size. The northern part is a high coralline limestone plateau rising up to 850 feet above sea level. The southern region, being volcanic in origin, is mountainous with elevations of 700 to 1,300 feet. Apra Harbor, one of the largest protected harbors in the Pacific, is located on the central western side of the island.

Guam is the westernmost territory of the U.S. and serves as a gateway to the dynamic and rapidly growing East Asia economies. A crossroads of Pacific, Asian, European, and American explorations, religious expeditions, military conquests, civilian commerce and multi-cultural exchanges over the last 400 years, Guam has been a Western Pacific hub for a century. It has the finest deep water harbor between Hawaii and the Philippines. With its strategic location and harbor, it has served as a key strategic base for American military operations since 1898, and can be expected to continue in that role, as well as assuming greater importance in Pacific trade activities.

Guam's estimated 1995 population of 149,249 is diverse in ethnic origin—40 percent Chamorro, 24 percent Filipino, 15 percent Caucasian, 5 percent Micronesian, and one percent Other Asian. The remaining 15 percent is a mix of ethnic groups.

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Guam's Organic Act established local self-government in 1950. Until then, the U.S. Navy had administered the island. With the passage of the Act, the people of Guam became U.S. citizens but, because Guam is a territory, citizens lack voting rights in the federal government—they cannot vote in Presidential elections. Representing Guam in the U.S. House of Representatives is a member who cannot vote on the House floor, but can vote in committees. Since Guamanians do not vote nationally, they do not pay federal taxes. The Organic Act provides for Guam income taxes to "mirror" federal income taxes—the Guam income tax law is the federal law with the revenue going to the Government of Guam. Thus, federal taxes collected from military personnel and other federal workers who must file federal returns, revert to the Guam treasury. In fiscal year 1993, such taxes amounted to $52.7 million.

In addition to tax laws, as an unincorporated territory, other federal laws also do not automatically apply. As an example, U.S. import tariff laws do not apply, thus making Guam a duty free port. Similarly, some federal banking and transportation laws and regulations apply to Guam, while others do not. As a duty-free port, Guam provides an easy means for moving raw materials for manufacturing. Guam is a participant of two major trade programs which benefit export-oriented manufacturing. General Headnote 3(a) of the Harmonized Tariff Schedule of the United States (HTSUS) provides for the duty-free treatment of goods from U.S. insular possessions. The Generalized System of Preferences (GSP) program, permits developing countries and territories greater access to markets of developed nations. Provisions may vary upon the nation allowing access to be an advantage. Guam in particular, is a beneficiary territory to the following countries: Japan, Australia, Canada, and the European Union.

There has been a movement in Guam since the 1970s to convert the island from a territory to a commonwealth, similar to the Commonwealth of the Northern Mariana Islands (CNMI) just north of Guam or the Commonwealth of Puerto Rico. The decision requires lengthy and broad-based negotiations and approvals by the legislatures of both Guam and the U.S. A change in political status, however, is not expected to materially alter Guam's link with the U.S., and therefore, its economic path in the 21st century.

3.3.2 Economy

Guam continues to change in economic structure and outlook. Tourism's rapid, and most recently uneven, growth has placed a powerful new force at work in the economy that is not yet clearly defined. A great deal of economic reordering will occur as the traditionally dominant defense industry in Guam undergoes restructuring. As income levels in Micronesia rise, there is some expectation that Guam will ultimately become a regional

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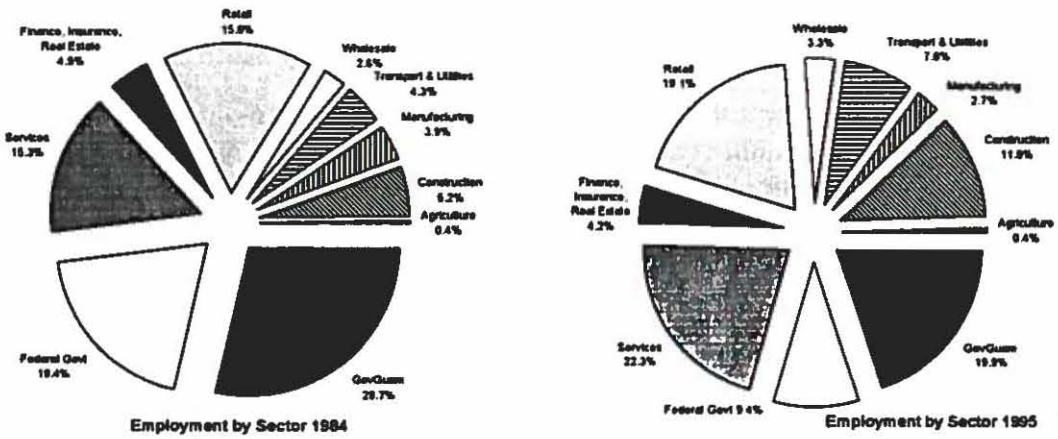
processing distribution center for the Western Pacific, boosting the third major component of its economy, regional trade and services.

Though less pronounced than when Guam was almost entirely employed as a U.S. military base, actions taken by both federal and local governments continue to play a dominant role in determining the economic patterns and well-being of the community. Until recently, no other industrial segment on the island approached government operations in its influence over jobs. Total employment at year-end 1995 was 65,130, excluding uniformed military personnel, but including federal civilian workers. Of the 65,130 employed, 46,040 (70.7%) worked in the private sector, while the remaining 29.3 percent or 19,090 worked for government. Federal employees, mostly civilians working for the military, numbered 6,120 (9.4 percent) while the Government of Guam employed 12,970 (19.9 percent) of all civilian employees. Hence, total government employment still accounts for almost one-third of all jobs. This unusually high ratio has had an even more potent impact with the decision of the Government of Guam at the beginning of this decade to raise government wages considerably above the average private sector rates. Figure 3.7 shows the distribution of employment by economic sector.

Figure 3.7
Source: Dept of Labor, Guam



The Government of Guam has not only been the largest employer for more than a decade, it owns and operates Guam's public utilities such as the telephone, power, and until the summer of 1996, the water and sewer systems. The local government's role as the largest employer and provider of services goes back to the communal character of the Chamorro

culture. Although property rights typical of market economies have evolved on Guam, the traditional attitudes of the extended family have not died in Chamorro-dominated communities.

3.3.3 Tourism

Guam is uniquely capable of developing into a major mass market destination for East Asia's rapidly rising numbers of overseas tourists. As global standards of living rise in the 21st century, the demand for leisure and leisure products will certainly grow. Likewise, rising living standards in the Asia-Pacific region will create greater demand for leisure travel, for which Guam is an attractive destination.

As many as 25,000 of the nearly 30,000 additions to private sector jobs over the past decade can be attributed to tourist arrivals which grew by almost three quarters of a million between 1984 and 1995. The job increase of 7,500 in the service sector during that decade was comprised largely of additional hotel workers to meet rising tourism needs. The same applies to the 7,000 job increase in retail, and the nearly 4,000 job increase in transportation and utilities. The result is that direct and indirect revenue generated by tourism is now likely to account for almost one billion dollars, or nearly one-third of Guam's gross production.

Construction jobs have been driven by tourism growth as well. Its rise from 1,800 in 1984 to a peak of 12,500 in 1992 was almost entirely due to the demand for increased tourist facilities and attendant resident housing in those years. Hotel room inventory, which rose by 50 percent in those years, appears to still be inadequate. Work to increase that inventory has helped keep construction employment and activity from declining more sharply from the record levels reached in 1992.

The tourist industry will be the single economic sector that will drive Guam's growth over the next 5 to 10 years. Guam is already a major destination in the Western Pacific, especially for Asian tourists. Guam offers tropical climate and a taste of American life close to Asia. The only U.S. territory closer to Asia is Guam's northern neighbor CNMI, which, though a major tourist destination, is much smaller than Guam.

Guam's tourist industry took off in the mid 1980s after the dramatic drop in the market value of the American dollar against major currencies, especially against the Japanese yen. In 1984, Guam received 368,620 tourists, up 5 percent from the previous year. The total rose every year until 1990 when it was up 112 percent to 780,404 from 1984. (In the same period, tourists to Hawaii increased 44 percent.) In 1991, total arrivals were down for the first time in a decade.

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Although Typhoon Omar hit Guam with force in September 1992, tourist traffic rose to 876,742 that year. But, the next year, when Guam was hit by an 8.3 earthquake that damaged a number of tourist facilities and infrastructures, arrivals dropped to 784,018. At the same time, the benefits of global currency exchanges that had made travel much cheaper and generated much of the speculative demand for U.S. assets by Japanese buyers had been exhausted. It was no coincidence, for instance, that tourist traffic to both Hawaii and Guam peaked in the 1990-92 period. By then, global currency markets had fully adjusted to the new regime in which the dollar was at its lowest value against the yen since World War II.

Table 3.9
Guam Air Tourist Arrivals
Source: Bank of Hawaii

Year	Tourist Air Arrivals	Hotel Rooms	Occupancy Taxes Collected
1974	260,568	2,250	700,000
1975	239,695	2,560	850,000
1976	205,096	2,350	739,412
1977	243,328	2,080	817,872
1978	238,818	2,080	990,000
1979	272,681	2,336	1,354,000
1980	300,767	2,345	1,508,000
1981	321,766	2,345	1,898,000
1982	326,389	2,416	2,357,000
1983	350,540	2,819	3,028,000
1984	368,665	2,964	3,501,540
1985	378,146	2,991	4,051,467
1986	407,070	3,248	4,533,912
1987	477,491	3,864	5,730,243
1988	576,170	3,939	8,825,854
1989	658,883	4,133	11,774,343
1990	769,876	4,955	14,250,931
1991	728,722	5,219	15,983,691
1992	863,094	5,584	18,252,569
1993	775,155	6,038	14,602,306
1994	1,076,437	6,100	13,695,652

The industry, however, has shown remarkable resilience—for the first time, over 1 million visitors arrived in Guam in 1994. By the end of 1994, Guam could justifiably claim to be a major tourist destination. And in the first six months of 1995, visitor arrivals were up 23 percent (to 644,159) over the same period in 1994 (524,659).

3.3.4 Defense Industry

The American military has maintained bases on Guam of varying strengths in both personnel and equipment since the turn of the century. In 1993, the Navy—principally at Apra Harbor—had 7,836 active duty personnel stationed on the island. The Air Force—at Andersen Air Force Base—had 2,550. Small number of personnel from the Army (56), Marines (55), and the Coast Guard (142), rounded out the total military active duty presence at 10,639. When dependents are added, the number rose to 22,000. Additionally, a little less than 7,000 civilians were employed by the defense industry and Guam was home to more than 5,000 military retirees. In 1994, total annual spending was estimated at $750 million, including funds from Section 30 of the Organic Act, and generated a multiple of that in direct and indirect incomes. Its average pay being double that in Guam's services economy, the military is Guam's only high-pay industrial employer.

Initially, at the end of 1994, Guam's job losses from the 1995 round of base closures were expected to be as many as 4,000 jobs between 1996 and 2001. Such a job reduction would have subjected Guam to an income loss proportionately much greater than that for any state, because of its small population and small, cyclical industrial sector. Since then, however, the projected job losses have been reduced and are now expected to be between 1,100 and 1,200 workers. The reduction is not surprising in that Guam will continue to have significant strategic value. With no bases in the area other than in Japan, Korea, and Hawaii, any emergency facing the U.S. in the Western Pacific requires easy access to the region. From a purely strategic point of view, Guam has the natural comparative advantage of its location.

Estimates are that, because of the skill and income levels involved in the defense segment, the removal of one defense job actually translates into removal of 2-½ jobs from the whole economy. For this reason, the reduction in BRAC-related loss of defense jobs is a welcome modification. Despite the easing in the numbers, BRAC will continue to have a sizable impact on all other sectors of the economy. The impacts, however, will be considerably less than what they would have been, had the reductions occurred ten years ago when federal and local government dominated even more of the labor market. Since then, as was seen earlier in Section 4.1, private employment has grown to account for two-thirds of Guam's total job count.

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Long after the 1995 base realignment and closing decisions are made, Guam will remain a highly valued strategic post in the Western Pacific. As much of the euphoria over the end of the Cold War is justified and a welcome change globally and in the Asia-Pacific region, strategic interests of the U.S. will continue to require access to ports in the Western Pacific. This will not change in the near future. Nor will the presence of the American military end on Guam in the foreseeable future.

Speculation on what U.S. military presence may be in Guam beyond 2001 does not lend itself to quantitative assessment, but it is safe to say that it will not be substantially different from what will evolve after the BRAC 95 series of closures and realignments. Defense will not be a growth industry in the next 5 to 10 years, but it will remain an important balancing force against cyclical fluctuations in the unpredictable market-driven tourism sector and the services it generates.

3.3.5 Construction and Retail

Guam's economy slowed in 1992-93 with the falling off of offshore investment and with real income undercut by inflation and natural disasters. A turnaround has been in progress since 1994, however.

In the first quarter of 1995, employment in services was up from the end of 1994 and back nearly to the peak of 1992, a reflection of gains in tourist arrivals. Building permits one of the best leading indicators of future building activity as well as overall economic expansion, have turned around strongly since peaking in 1991, then declining.

Table 3.10
Building Permits
($ thousands)

	1990	1991	1992	1993	1994*
Residential	140,813	217,457	121,585	211,856	135,492
Hotel & Condominiums	292,866	279,090	69,572	56,568	8,956
Commercial & Industrial	51,070	67,243	62,810	87,684	93,232
Public	70,589	71,294	78,950	107,910	376,191
Other	25,247	159,132	32,420	16,888	37,704
Total:	580,585	794,216	365,337	480,906	651,575

* First three quarters only
Source: Bank of Hawaii

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Total building permits amounted to $794.2 million in 1991, up nearly 550 percent over the previous 5 years. The gain was widespread, occurring across the residential, hotel and condominium, and commercial and industrial categories. As rapidly as they had risen, total permits dropped even more rapidly from 1991 to 1992, but the slide ended in that year. Total building permits in 1992 amounted to only 46 percent of the 1991 peak. They then rose nearly 32 percent in 1993, and another 36 percent in 1994 (based on data from the first three quarters).

Government building permits increased the most in 1993-94—airport expansion representing a large part of government building activity. Hotel and condominium permits dropped from $279.1 million in 1991 to $69.6 million in 1992, %56.6 million in 1993, and $9.0 million in 1994 (first 3 quarters only) when no major hotel projects were authorized. Residential permits were down 56 percent from 1993 and 61 percent from their 1991 peak but nevertheless showed considerable strength at $135.5 million. The number of housing units authorized for building on Guam has remained remarkably stable at slightly over 1,100 units since 1987. The exception, again, was in 1993 when the total unit count rose to 2,033.

One of the broadest measures of economic activity, business tax receipts, showed evidence of improvement in first-quarter 1995. While it is not clear which segment of retail—luxury end which caters mostly to tourists, or regular sales to residents—grew the most, it is certain that the arrival of both big box retailers (Cost-U-Less, K-Mart) and a Hawaii-based luxury department store (Liberty House) contributed to the sales boost.

As retailers sort out their respective markets and establish their niches, retail sales will likely be volatile for some time, but the overall trend in retail sales should be upward as the economy gathers momentum. The upswing in retailing indicates a general economic rebound and in particular the resurgence in tourism.

3.3.6 Guam's Economic Future

The challenges Guam faces in the next 5 to 10 years are complex. It will have to maintain and upgrade its basic infrastructure, especially roads, power, and water services, add facilities to accommodate a rapidly increasing number of visitors, and expand its delivery of tourism services.

Of Guam's two principal primary economic sectors—tourism and military—only tourism will expand over the next 5 to 10 years. Tourism is already larger than defense, and as tourism grows, so will the island's secondary industries. Tourism is one of the world's largest and most rapidly growing businesses, and is particularly active in the Asian half of

the Pacific rim. The combined GDP of Japan, China, Taiwan, Hong Kong, Korea, Australia, and New Zealand is $6.3 trillion. This group of nations represents a vast market with a population that exceeds 1.4 billion.

Among the economies of the region, excluding China, the per capita GDP of $27,600 a year is 30 percent higher than that of the European Union. The U.S. annual per capita GDP of $27,000 is slightly lower than the Pacific Rim group average and far lower than Japan's per capita annual GDP of $39,000.

Nearly 12 million Japanese travel overseas annually, and this number is likely to double in the next decade. Similar, or even larger gains in the demand for travel can be expected in the other industrial economies of Asia. With the demand for travel rising in the region, Guam offers some of the most desirable destinations in the world. To the extent that tourism is the Western Pacific's comparative advantage and high-saving and high-spending Asian tourists want to travel to places that offer the tourist services they seek, the two regions will benefit from each other's growth and prosperity.

It is not unreasonable to expect tourist arrivals to Guam to double in the next 5 to 7 years if infrastructures can expand to absorb the new growth. Nor is it unrealistic to expect that hotel room inventory will double in the next 5 to 7 years to about 12,000 rooms. If these changes occur as they are expected to do, they will more than offset the negative impact of expected cutbacks in the military payroll and generate new economic activity at a healthier level than otherwise possible in the region. Moreover, they will also generate indirect demand for some of the more remote and less commercial destinations in the rest of Micronesia.

How the primary benefits of tourism jobs, income, and taxes can be used to generate other sources of income—e.g., regional trade and distribution center, ship repair facility—to diversify Guam's economic base will be a key challenge in the near to middle term.

3.4 Market Demands

3.4.1 General

This section describes the expected market conditions and potential market-driven demands for reuse of excess facilities at Apra Harbor, Guam. Portions of the naval facilities are available for immediate interim lease to the Government of Guam, while other areas are scheduled for permanent realignments and closures as early as September 1997. Upon closure, new entities—private corporations, quasi-government entities,

private-GovGuam joint ventures, or similar organizations—are expected to assume control of the facilities and operations.

Three general categories of market needs are assessed in the remainder of this section:

- Ship repair/industrial manufacturing
- Fishing industry
- Tourism, to include:
  - Hotel development
  - Retail sales
  - Theme park/waterpark/aquarium
  - Dinner cruises and day excursions
  - Cruise ship travel
  - Casino gambling

3.4.2 Ship Repair/Industrial Manufacturing

3.4.2.1 General. Assessing world shipping supplies suggests that a severe aging crisis is developing. Existing freight and charter rates throughout the world are discouraging construction of new vessels. The result is that the average age of the world fleet will rise from the 16-year level of 1993 to easily exceed a disturbing and unsustainable 20 years by the end of the present decade.

The consequence of this aging has been some recovery in the recently depressed ship repair industry. But even that and new ship building that began to grow again in 1994 was fought over by major Asian nations for what has come to be regarded as the privilege of losing the least money while still keeping their shipyards open. Capacity utilization of the yards is up significantly from the lows of 1992, but the earnings of Asian shipyards have not reflected that.

Several interrelated conditions are causing this. The most important is that the ship building and repair industry is extremely cyclical and thus sometimes suicidally competitive. As a result of heavy building and repair orders a decade ago, existing capacity was expanded in many fabrication ports, and repair yards or floating docks expanded or developed where none existed before. Within a span of 10 years, the Persian Gulf area has become a major competitor to the world's largest repair center of Singapore. Compar-

ative costs as well as steaming time are critical determinants of yard choice, and it appears that many repair yards in Asia (outside Singapore) will need to remain subsidized in order to attract clients and stay alive within the price characteristics of this industry.

The regional market for ship repair and construction is quite advanced. Korea leads in the construction of large vessels. Surplus quantities of vessels and excess production capacity in Korea and other large ship building centers in Asia has frequently moved those centers aggressively into ship repair with very low charges. The volatility in volume and price that characterizes this industry proves especially difficult for small producers that from time to time may be shut entirely out of a shrinking market. Unless a small repair yard can develop a niche that ignores the larger market fluctuations, its survival is doubtful.

The fact that Guam does not now lie on a major trans-Pacific shipping route poses a significant challenge to its goal of establishing and maintaining a ship repair industry. In light of Guam's relative cost and labor disadvantages, as well as the labor force depth of competing Asian shipyards, development of a production and marketing specialty is critical to the success of a ship repair yard in Guam. The following assessment indicates that significant reliance must be placed on current and future U.S. federal (Navy and others) work in order for a ship repair function to be viable.

Five general categories of customers are potentially available to the new SRF:

- The U.S. Navy and other agencies and departments of the federal government
- Large, commercial shipping companies
- The fishing industry and recreational boat users
- Customers requiring small-scale industrial repairs
- Work attributable to the Foreign Military Sales (FMS) program

Each of these market segments are discussed in turn.

3.4.2.2 U.S. Navy and Other Agencies and Departments of the Federal Government.

Military Sealift Command (MSC). The Military Sealift Command supplies the Navy's deployed fleets in the western Pacific and Indian Oceans. Manned and operated by Department of the Navy civilians, MSC ships take-on supplies in Guam and Japan, and replenish the supplies of the deployed fleets. In the past, two types of

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MSC vessels have called on the Fleet Industrial Supply Center (FISC) located at Apra Harbor, Guam:

AFS: Auxiliary Fleet Supply Ships

AE: Auxiliary Explosive Ships

Among the MSC ships that have called on Apra Harbor, at present, four vessels are forward deployed to Guam. These are the three AFS ships—USNS Spica (TAFS 9), USNS San Jose (TAFS 7), and USNS Niagara Falls (TAFS 3)—and the AE ship, USNS Kilauea (TAE 26). The AFS vessels, also called Combat Stores Ships, were formerly Royal Navy replenishment ships and purchased from Great Britain to support increased logistics requirements of two carrier battle groups in the Indian Ocean. TAFS 9 displaces 16,792 tons under full load, is 524 feet long, and has a beam of 72 feet. TAFS 7 displaces approximately 16,000 tons under full load, is 581 feet long, and has a beam of 79 feet. The ammunition ship, TAE 26, displaces approximately 20,000 tons under full load, is 564 feet long, and has a beam of 81 feet.

In addition to onloading fleet supplies, the MSC ships obtain shore industrial support, repair, maintenance, overhaul, and drydocking services from the SRF while in Guam. To maintain its vessels, the MSC uses the most convenient ship repair facility that is selected largely based on the fleet's specific deployment schedule. For example, Guam's SRF is likely to be used if the AFS/AE's voyage and schedule calls for stops at Apra but, if the fleet is deployed in the Indian Ocean, there is no compelling requirement for the MSC to obtain service by returning to Guam.

Each MSC vessel operates on a 15-month repair and maintenance cycle. Vessels call for repairs for either MTAs (Mid-Term Availability) or ROHs (Regular Overhaul). MTAs are performed top side at the pier—and takes a few thousand mandays—whereas the ROHs are performed in a drydock, and could take 17,000 mandays or more. Every 15 months, a vessel will commission a SRF to perform whichever task is required under its scheduled maintenance cycle. The MSC is expected to select the specific repair sites based on competitive selection procedures. Hence, the fact that four MSC ships are expected to be forward deployed to Guam is no guarantee that normal, scheduled maintenance services will continue to be performed at Apra Harbor's newly privatized SRF.

In addition to scheduled maintenance services, the SRF provides unscheduled Voyage Repairs (VRs). Typically, VRs consume between 10 and 14 days per quarter, and may occur once per quarter for each of the MSC vessels.

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Table 3.11
Repairs & Maintenance of MSC Vessels
(Mandays of Work)

Vessel	FY93	FY94	FY95	FY96
USS White Plains (AFS-4)	12,732	12,575	1,450	
USS San Jose (AFS-7)	17,879		3,000	4,600
USS Haleakala (AE-25)	8,477			
USS Niagara Falls (AFS-3)	627	6,453		1,000
USS Holland (AS-32)	562			
USNS Spica (TAFS-9)	1,726		15,400	
USNS Sioux (TATF-171)	477			
USNS Catawba (TAFS-168)		13,199	700	
USNS Mars (TAFS-1)		8,069	3,000	
USNS Kilauea (TAE-26)		1,046	4,500	15,000
USNS Narrangansett (TATF-167)			2,400	
Totals (MD)	**42,480**	**41,342**	**30,450**	**20,600**
Totals (MY @ 212 MD/MY)	**200**	**195**	**144**	**97**

Based on historical repair data, a privatized SRF can expect approximately 180 manyears of workload to support the MSC. Table 5.1 summarizes repair data for MSC vessels. In evaluating the data, figures for FY96 can be discarded as in that year (1) the SRF placed its priority on overhauling AFDM-8, a drydock assigned to the SRF, and (2) the SRF prepared for closure. Thus, required and scheduled MSC work was intentionally minimized at SRF, Guam, the work being transferred to other sites. Taking the workloads for FY93, FY94, and FY95 then, and averaging the figures, results in 38,091 mandays of annual effort, or 180 manyears of expected MSC workload.

Notwithstanding the projected MSC work, the impact of the disestablishment of FISC, Guam, needs to be considered. The drawdown could have significant impact on the future deployment and "home porting" of the MSC ships in Guam. Under the disestablishment plan, FISC, Guam, is to initially become a detachment under the command of FISC, Pearl Harbor, Hawaii, and later transition into a totally commercial operation under a comprehensive Base Operations (BASOPS) contract. The implication is that as the FISC, Guam, supply stockages decrease, MSC ships are likely to find it more and more convenient to take on fleet supplies at other FISCs—in Japan, for example. Should MSC vessels onload supplies elsewhere, they would likely

obtain scheduled repairs elsewhere too. Thus, under such a scenario, MSC ships will only stop in Guam for emergency Voyage Repairs, dramatically reducing the SRF's workload.

Seventh Fleet Voyage Repairs. Headquartered in Japan, the U.S. Seventh Fleet operates in the western Pacific and other areas in support of the Pacific Fleet at Pearl Harbor. Although Guam is not a regular deployment site for the Seventh Fleet, its vessels call at Apra Harbor from time to time for supply replenishment, repairs, and R&R (rest and recreation). Records provided by the U.S. Navy are summarized in Table 3.12 which shows the following mandays of effort were expended by the SRF in servicing Seventh Fleet vessels.

Table 3.12
Repairs & Maintenance of Seventh Fleet Vessels
(Mandays of Work)

Vessel	FY93	FY94	FY95
USS Tarawa (LHA-1)	97		
USS San Bernadino (LST-1189)	669	575	
USS Dubuque (LPW-8)	10	484	
USS Belleau Wood (LHA-3)	12	1,241	
USS Germantown (LSD-42)	5	475	
USS Chancellorsville (CG-62)	5		
USS Blue Ridge (LCC-19)		117	
USS Beaufort (ATS-2)		72	
USS Flint (AE-32)		174	200
USS Brunswick (ATS-3)			80
Totals (MD):	**798**	**3,138**	**280**
Totals (MY @ 212 MD/MY):	**3.8**	**14.8**	**1.3**

By averaging the workloads for the three fiscal years, an estimated workload of 6.6 manyears can be expected for the SRF for supporting Seventh Fleet deployments.

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Maritime Prepositioned Ships (MPS). The vessels of the Maritime Prepositioned Ship (MPS) fleet support Marine amphibious forces. Currently, there are four MPS located in the Guam/Tinian/Saipan area. Two other MPS are positioned in the Persian Gulf. The ships contain and transport the equipment, ammunition, and 30 days of supplies needed by a Marine Expeditionary Brigade and are capable of offloading at piers or from offshore locations using special equipment fitted on the ships. The Iraqi invasion of Kuwait provided a superb opportunity to dramatically prove the effectiveness of the concept. Personnel of the Marine Expeditionary Brigade linked with MPS ships in Saudi Arabia seven days after the ships had departed from Diego Garcia. Those Marines were ready for combat 23 days after the invasion, and represented the first U.S. heavy combat force in the theater of operations.

The MPS ships are leased from a commercial operator, American Overseas Shipping in Quincy, Massachusetts, a subsidiary of General Dynamics. American Overseas Shipping is responsible for maintaining the vessels. Every 30 months, each ship returns to Blount Island, near Jacksonville, Florida, as part of the Marine Corps Maintenance Cycle. While at Blount Island, the cargo is offloaded, inspected, and repacked with expiring shelf-life items replaced. Concurrently, the ship itself is sent to a commercial shipyard, typically on the East or Gulf coasts, for overhaul. Upon completion of the overhauls, the ship returns to Blount Island where it is reloaded for return to its designated preposition site in the Pacific.

Similar prepositioning of supplies and equipment supports U.S. Army forces. According to the Manager of Ambyth Shipping in Guam, the Army leases seven ships from InterOcean Uglen Management in New Orleans, Mersek in Virginia, and Bayship Management in New Jersey. As in the case of the MPS ships that support the Marines ("Blackhulls"), the MPS ships that support the Army ("Greyhulls") operate on a similar repair and maintenance cycle.

When visiting Guam, MPS vessels may need voyage repairs to maintain their operational status. While much of this is performed by the ship's crew, some work is beyond their capabilities and must be secured from local ship repair yards. Because the MPS ships are too large to be serviced by the drydocks currently assigned to the SRF (AFDM-5 and AFDM-8), no major work can be completed in Guam. MPS ships are generally 800 to 900 feet long and displace approximately 45,000 tons. One operator, American Overseas, reports that typically, only $2,000 to $3,000 of voyage repair work are conducted while docked in Guam. The work is bid to local repair companies, Casamar being their primary servicing agent. Other local businesses they have employed include Pacific Welding, JWS (refrigeration), and JMI (motor rewinding). The Navy's SRF has performed only minor work for the MPS vessels.

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Between FY91 and FY95, the SRF provided 141, 136, 142, 128, and 137 mandays of support annually—an average of 0.6 manyears per year.

The potential for a privatized SRF to service MPS vessels is small. The system for performing major overhauls in conjunction with supply replenishment operations are not likely to be changed. Historically, voyage repairs while deployed vessels visit Guam have been minimal. One constraint is that only a limited amount and type of work can be performed even topside because the ships carry ammunition and explosives. Hence, for all practical purposes, potential MPS workloads should be discounted in preparing a business plan for the privatized SRF.

Diego Garcia Supply Run. The Military Sealift Command (MSC) charters a privately-owned ship, the *Margaret Choueste*, to shuttle supplies—island support material—from Guam to Diego Garcia. Operating on a 45-day cycle, the vessel departs Guam for Singapore where it picks up additional supplies, and proceeds to Diego Garcia. On its return trip, the vessel transports excess equipment, material requiring repairs, and similar backhauls.

With FISC, Guam, being directed to disestablish, Commander-in-Chief, Pacific Fleet initiated a Senior Working Group Review of all FISC-related missions, including the continuance of the Diego Garcia shuttle from Guam. The analysis focused on two alternatives for the Diego Garcia shuttle—Apra Harbor, Guam, and Yokohama, Japan—as the supply base. By letter dated August 9, 1996, Governor, Guam, was informed by Commander, Naval Forces, Marianas, that the decision remains pending between the Chief of Naval Operations and Commander-in-Chief, Pacific Fleet, but is expected in approximately 60 days.

While a decision to base the shuttle in Japan would significantly impact supply operations, its direct impact on the SRF is insignificant. Historically, the SRF has not performed repairs on the commercial Diego Garcia ships. Thus, even if the Diego Garcia shuttle remains home ported in Guam, the prospects for an immediate maintenance and repair workload are slim. Should the decision be made that the shuttle is to be home ported in Japan, then it is extremely unlikely that SRF Guam would be chosen for overhauls and repairs.

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U.S. Coast Guard. The U.S. Coast Guard station at Apra Harbor has one patrol boat and one buoy tender to support its mission needs. Operating from a 400 foot long section of Victor wharf in the Inner Apra Harbor, the Coast Guard supports both military and civilian needs.

Patrol boats like the *Galveston Island* (WPB 1349) that is assigned to Guam, are used primarily to support search and rescue operations, maritime law enforcement, and port security. About 110 feet long and 21 feet wide, under full load, these patrol boats displace approximate 165 tons. The *Basswood* (WLB 388) is a buoy tender, that as a class, has proven to be highly versatile, durable, and reliable ships capable of performing a variety of missions.

The continued presence of the U.S. Coast Guard is assured by virtue of Guam's geographic location and maritime activities. The Coast Guard has historically used the Navy's SRF to meet both its scheduled and unscheduled repair needs. Once every two years, one of the two vessels undergoes an overhaul which consumes between 1,200 and 3,000 mandays of work. The SRF has also provided unscheduled repair services to the Coast Guard on a small scale, averaging about 100 mandays per year. Table 3.13 summarizes the support provided to the Coast Guard by the SRF.

Table 3.13
SRF Support to the U.S. Coast Guard

	FY91	FY92	FY93	FY94	FY95
Mandays	3,817	2,364	3,166	4,251	6,069
Manyears	18	11	15	20	29

Averaging the workloads for the past five fiscal years yields an estimated workload projection for a new, commercial SRF of 19 manyears per year.

On-Shore DoD Activities. Over the years, the Navy's SRF has supported a variety of shore-based organizations to supplements it's fleet repair workload. In the future, these activities are likely to require the same level of repair support from a privatized SRF. Shore-based activities that have regularly received support from the SRF include the following:

- NAVACTS, Guam: Major work includes the complete overhaul of one to two service crafts annually, each craft consuming 2,500 to

5,000 mandays of effort. Minor work includes emergency repairs to various service craft; floating crane services; electrical/electronic test equipment; radiac repair and calibration; mechanical gauges and instruments; optical instrument repair; and industrial laboratory analysis. The minor work have averaged approximately 1,000 mandays per year.

- PWC, Guam: Services include repairs to various electrical and mechanical equipment; repair and calibration of electrical and electronic test equipment and mechanical gauges; optical and radiac instrument calibration; industrial laboratory analysis; floating crane services; and occasionally, prefabrication of shapes and brackets. Average workloads have been approximately 1,000 to 1,500 mandays per year.

- FISC, Guam: Services include repairs to material handling equipment (MHE); floating crane services; minor repairs to electrical and mechanical equipment; calibration of radiac and electronic test equipment; and industrial laboratory analysis. Approximately 600 mandays of support per year has been provided.

- NMCB: (Seabee Battalion) Approximately 300 mandays per year have been provided to repair various electrical and mechanical equipment; structural prefabrication and repair; preservation work; repair and calibration of electronic instruments; repair and calibration of optical and mechanical test instruments; floating crane services; and industrial laboratory analysis.

- NISE: (Naval in Service Engineering) Support services include the fabrication of structural shapes and machine work as well as providing experienced electrical, mechanical, and electronic journeymen under a personnel loan program.

- EOD: Approximately 40 to 80 mandays per year have been furnished by the SRF on miscellaneous support services.

- SEALS: Support similar to the EOD has been provided to the SEALS.

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- U.S. Air Force: Support services have included calibration of electrical, electronic, and mechanical test equipment; calibration of radiac instruments; repairs to miscellaneous electrical and mechanical equipment; and industrial laboratory analysis.
- U.S. Army: Similar support as in the case for the U.S. Air Force.
- NCTAMS: (Communications Facility) Similar support as in the case for the U.S. Air Force.

Table 3.14 summarizes the support provided by the SRF to these shore-based DoD activities between FY91 and FY95.

Table 3.14
SRF Support to Shore-Based DoD Activities
(Mandays)

Agency	FY91	FY92	FY93	FY94	FY95
NAVACTS	5,819	4,965	6,072	5,637	3,811
PWC	4,651	3,966	4,746	4,272	4,954
FISC	805	647	685	631	1,014
NMCB	78	62	84	71	66
NISE	1,208	1,025	1,089	1,261	991
EOD	102	93	113	126	87
SEALS	0	0	628	541	253
USAF	20	15	12	9	10
USA	8	6	5	3	5
NCTAMS	87	128	94	80	164
Totals (Mandays)	12,778	10,907	13,528	12,631	11,355
Totals (Manyears)	60	51	64	60	54

The average manyears of support provided by the SRF to other DoD agencies is approximately 58 manyears per year. A commercial SRF could expect to be competitive in providing the same level of services, except in the case of personnel loans to NISE, which is scheduled to close this fiscal year.

3.4.2.3 Large, Commercial Shipping Companies. Drewry Shipping Consultants, Ltd., in their *Ship Costs: Their Structure and Significance* estimates that ship repair and maintenance costs are likely to double by the year 2000. The report predicts a rise in almost every aspect of ship operations. With respect to ship repair, since the world's shipping fleet is aging, repairs and maintenance are on the rise. By the end of the 1990's, the report estimates that ship owners are likely to pay close to $1 million per year for maintaining a typical 2,000 TEU (Twenty-Foot Equivalent) container ship or a medium-sized refrigerated cargo ship. As the world's shipping fleet ages, the facts are that these vessels must undergo major overhaul, or perhaps be scrapped. According to a 1991 Japanese research effort, demolition tonnages will begin to rise in 1995 and is expected to exceed 30 million tons in the year 2000.

These figures indicate that ship repair services appear viable and practical well into the next century. Competition, however, is intense—the workloads of U.S. repair facilities have been steadily decreasing in comparison to the increasingly dominating workloads of Asian repair facilities. The most likely impetus for repairing large commercial ship would occur if the new SRF secures contracts for repairing container ships that call on Guam regularly. Table 3.15 shows the number and types of commercial ships that called on Apra Harbor in Fiscal Years 1994 and 1995.

Table 3.15
Vessel Arrivals by Type

Vessel Type	FY94	FY95
Break Bulk Cargo/Ro-Ro	429	477
Cement Carriers	23	31
Containerships	112	117
Cruise/Passenger Vessels	37	29
Research Vessels	13	19
Tankers	126	108
Training Vessels	5	4
Tugs and Barges	213	169

Table 3.16 lists the major shipping carriers that serve Guam.

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Table 3.16
Existing Shipping Services

Carriers	Frequency of Service	Type of Service	Routing/Area Served
Matson Navigation Co.	Weekly	Containers	US West Coast, Honolulu, Guam, Kaohsiung
Sea-Land Service	Weekly	Containers	US West Coast, Honolulu, Guam, Kaohsiung
Kyowa Shipping Co.	Tri-Weekly	Containers/ Break Bulk	Hong Kong, Keelung, Pusan, Guam, Kobe, Yokohama
	Every 4 weeks	Containers/ Break Bulk	Singapore, Manila, Guam, Saipan
	Monthly	Containers/ Break Bulk	Kobe, Yokohama, Saipan, Guam
Kambara Kisen Co. & Far East Micronesia	Tri-Weekly	Containers/ Break Bulk	Pusan, Hong Kong, Keelung, Guam, Saipan
Zim Israel Navigation	25-28 days	Containers	Sydney, Melbourne, Brisbane, Guam
Saipan Shipping Co.	Weekly	Containers/ Break Bulk	Guam, Saipan, Tinian
Seabridge Pacific Co.	Weekly	Containers/ Break Bulk	Guam, Saipan, Tinian
Angyuta Shipping Co.	Weekly	Containers/ Break Bulk	Guam, Rota
Tapulso-Saipan	2-3 months	Containers	Guam, Rota
Palau Shipping Co.	Tri-Weekly	Containers/ Break Bulk	Saipan, Guam, Yap, Palau
The Tiger Line	Monthly	Containers/ Break Bulk	Saipan, Guam, Chuuk, Yap, Palau

Of the shipping companies listed in Table 3.16, only Matson and SeaLand use large container ships that cannot be readily serviced by Guam's SRF—the vessels are too large. In September 1995, for example, Matson entered into a 10-year agreement with American

President Lines to consolidate and cooperate on the companies' trans-Pacific operations. Under the agreement, Matson acquired six APL containers ships including three C-9 class vessels, the largest and most modern American-built vessels to sail in foreign trades, and three C-8 class vessels.

All other shippers are regional carriers who use relatively small container ships to island-hop among the nations of Micronesia and the western Pacific. These latter shippers use vessels in the 6,000 ton range which are capable of being serviced by Guam's SRF. Whether these shippers can be convinced to use the SRF as a repair facility remains to be seen. Traditionally, ship repairs are conducted at a major port at the end of a shipping route, not at a port in the middle of a shipping route. Typically, only emergency repairs are conducted at ports which lie in the middle of a supply run. Thus, given Guam's geographical location with respect to the major shipping lanes in the region—Guam is not really on the way to Asia—it would be difficult for commercial shippers to make Guam a preferred repair location. Intense marketing, competitive rates, superior service, and excellent quality of work would be absolutely essential. Until the privatized SRF, Guam, can establish such a reputation, commercial shippers are unlikely to use the SRF for anything other than emergency voyage repairs.

3.4.2.4 Fishing and Pleasure Crafts.

LongLiners. Determining port call data accurately for fishing vessels presents a significant challenge. While data is available, they often conflict. For example, in 1994, the Guam Department of Commerce records show that 1,512 longliners called at the Port. For the same year, a study by Michael P. Hamnett, et.al., titled *The Contribution of Tuna Fishing and Transshipment to the Economies of American Samoa, Guam, and the Commonwealth of the Northern Marianas Islands* cites the Port Authority of Guam as the source for estimating total port calls in 1994 at 1,197 longliners. However, later in the same report, a figure of 1,509 is reported. Using the latter table as the source, longliner port call data is estimated as follows:

Table 3.17
Estimated Longliner Port Calls at Apra Harbor

Year	Port Calls	Vessels Based in Guam
1990	1,450	328
1991	1,078	233
1992	846	246
1993	1,089	270
1994	1,509	348
1995	2,580	480

Virtually all of these longliners consist of vessels from Taiwan and Japan. Vessels of other flags, most commonly, Korea, Honduras, and U.S., are only seen occasionally. For example, in 1994, 67 percent of the port calls at Apra Harbor were by 271 Taiwanese vessels and 32 percent by 73 Japanese—only one percent of the total port calls were be vessels of other flags. Data for the first seven months of 1995 shows a similar breakdown—74.9 percent being made by 218 Taiwanese and 24.8 percent by 53 Japanese longliners. The vessels are small in relation to the distance from their home ports—they range from 19 to 80 tons, and are generally 49 to 80 feet long.

Despite the large and increasing number of vessels that call at Apra Harbor and the great distance from their home port, little maintenance has actually been performed while in Guam. All scheduled maintenance is done in their Asian home ports, only unscheduled emergency repairs being performed in Guam. Crews are largely self-sufficient, meaning they can perform their own routine repairs, and carry spare parts for performing voyage repairs. In those instances when repairs could not be accomplished by their crews, foreign longliners have hired a small local engine repair firm to assist them. Most of the emergency work on Guam involves repair of navigation or refrigeration equipment, or engine overhaul.

To support the emergency repairs trade for the longliners, a mainland firm had on its staff, one full-time diesel mechanic, but found the work volume to be insufficient. The mechanic is reportedly now operating an independent repair shop. Apparently, the longliner workload is just sufficient to maintain his business. The Guam Department of Commerce document, *Study of the Longline Fishery in Guam: Assessment of the Market and Economic Impacts,* further supports the nature of longliner repairs when it reports that in 1990, only $27,000 of repairs were performed on foreign longliners in Guam. The figures are not much different for 1995. The Department of Commerce reports that approximately $36,500 of repairs were performed during 2,027 port calls by longliners in that year.

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The conventional thinking is that longliners will represent a very small market for a ship repair yard, and workload from that industry will be minimal. Performance of scheduled overhauls in Guam will not be a reality until a commercialized Guam SRF can prove its cost competitiveness with respect to repair yards in their Asian home ports.

At least one agent/broker—one who organizes port entry, customs, immigration, fuel, water, chandlery, transshipments, etc.—who currently operates a fleet of 71 boats in waters in and about the Republic of Palau has expressed interest in Guam's capability to perform longliner overhauls. Currently, his fleet of Taiwan-based longliners make the 14-day voyage to Taiwan annually for overhaul, then make the 14-day return voyage to the fishing site once repairs have been completed. The repairs themselves take 15-30 days per year for wooden-hulled vessels, 5-7 days for fiberglass vessels, and steel-hulled vessels are repainted once every two years. In discussing a Guam ship repair facility, the agent indicated that he may very well prefer to repair his fleet here because of its proximity to Palau. As for home visits for the crew, the agent believed that flying them home from Guam would be more economical than sending the vessels and crew back to Taiwan for overhaul. Hence, while longliner repairs are minimal to non-existent now, it could be developed into a viable operation.

Purse Seiners. As with longliners, accurately determining the number of purse seiner calls at Apra Harbor is difficult. The following figures are based on figures from the Port Authority of Guam (for 1992 through 1994) and from the Department of Commerce (for 1995).

Table 3.18
Estimated Purse Seiner Port Calls At Apra Harbor

Year	U.S.	Japan	Korea	Taiwan	Other	Total
1992	71	16	60	40	31	214
1993	71	13	91	64	18	257
1994	63	16	45	68	9	201
1995	*	*	*	*	*	330

* Data not available

The significant increase in port calls in 1995 can be attributed to two causes: (1) In 1995, the Port Authority of Guam waived wharfage fees for purse seiners, and (2) direct frozen tuna transshipments from Guam to Asian canneries was initiated. In

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March 1995, Casamar, Inc., began shipping frozen seiner tuna to Thai tuna canneries via American President Lines' (APL) refrigerated containers. The container operation is estimated to be 35 percent cheaper than transport by conventional reefer vessels and, from a packers' perspective, refrigerated containers are easier to manage and handle than an entire reefer vessel of tuna. For APL, the operation provides the benefit of backhauling full refrigerated containers to Asia instead of the normally empty loads.

Purse seiners are even more self sufficient in terms of repair and maintenance capabilities while on voyage. Their principal repair needs while in port are to the nets and, to a lesser extent, the hydraulic system that operates the nets. The Department of Commerce reports that in 1995 approximately $62,000 per vessel, for a total of $20.5 million, were spent on repairs by purse seiners. The figure includes net repairs, which is believed to constitute the vast majority of the total.

There are two firms that service the purse seiner industry in Guam—Casamar, Inc., and Dong Wa. While Casamar has the larger operation, both have established themselves in this somewhat of a niche industry. Because Casamar is itself a net maker and manufacturer, it provided much of the netting that are used by the purse seiners. Casamar is also an agent/distributor for the "Marko" hydraulics system, who is perhaps the major provider of the various gears, lines, and pumps to the purse seiners. Given those advantages, and the newly initiated Casamar/APL transshipment of frozen tuna, it would be difficult for an unrelated entity such as SRF Guam to enter the relatively captive and established niche market that is in place. One market that may be open is that for U.S. flag purse seiners who, in an effort to minimize costs, currently use shipyards in Carnes, Australia; Cebu, Philippines; Whangarei, New Zealand; and Singapore for their maintenance requirements.

Small Pleasure Crafts. Four marinas provide berthing for privately-owned boats—Agana Marina, Agat Marina, Marianas Yacht Club, and Sumay Harbor. Because boat registration records were found to be outdated to be of practical use, a visual inventory was performed to estimate the number of water crafts longer than 25 feet. The 25-foot length was selected since that is the maximum length which can be easily removed from the water and transported via trailer to a small repair yard. Larger boats generally must be worked on either in its berth, or lifted onto a landside "drydock" rig for repairs. The results of the inventory are as follows:

Table 3.19
Potential Use of a Drydock by Small Crafts

Marina	Total Vessels	Vessels > 25'	Percent > 25'	Predicted Frequency of Use	Estimated Number that may use a Drydock
Agana	52	44	85%	75%	33
Agat[1]	70	60	85%	75%	45
Marianas	29	25	86%	75%	19
Sumay	40	34	85%	75%	26
Totals:	191	163			123

[1] The inventory for Agat Marina did not segregate boats > 25' in length from shorter boats. Therefore, the total number of vessels in the harbor (70) was multiplied by the average percent of vessels that were > 25' in the three other harbors (85%) to estimate that 60 of the vessels in Agat Marina were > 25 feet in length.

Once the number of boats that were greater than 25 feet was estimated, a "predicted frequency of use" factor of 75 percent was used to determine how often a drydock might be used. This assumes that these vessels will drydock once every 18 months, a fairly conservative estimate. Table 5.9 estimates that about 123 vessels could use a drydock annually. Assuming that each vessel will require about 160 manhours of work, the total annual workload for 123 small pleasure crafts can be estimated at 19,680 manhours or a little less than 12 manyears.

3.4.2.5 Small-Scale Industrial Repairs. Having the largest and most comprehensive industrial repair capabilities in the western Pacific, the SRF has provided minor repair and support services to Government of Guam departments and agencies as well as to commercial firms in the private sector. Restricted from competing for services that are available in the private sector, the Navy's SRF was not in a position to actively market its capabilities to these markets. A commercialized SRF, however, will not be so restricted and could conceivably secure a larger volume of non-federal work. The principal customers that have been serviced by the SRF include the following:

- GPA: Guam Power Authority. Support services have included repairs to electrical and mechanical equipment—generators, motors, pumps; cleaning and repairing of boilers, condensers, and piping systems; testing, repairing, and calibration of electronic equipment

and gauges; industrial laboratory analysis; structural fabrication and welding work; welder certifications; and machine work.

- PAG: Port Authority of Guam. Support services have included repairs to electrical and mechanical equipment of portal cranes; floating crane and rigging services; industrial laboratory analysis; test, repair, and calibration of electrical/electronic and mechanical test equipment and gauges; structural fabrication; and machinery work.

- GWA: Guam Waterworks Authority (formerly, Public Utility Agency of Guam—PUAG). Minor machine shop services have been provided by the SRF on an irregular basis.

- Private Firms: A variety of miscellaneous services have been provided that are not readily available in the private market. These services have included specialized repairs to structural, mechanical, electrical, electronic, and optical equipment; industrial laboratory analysis; non-destructive testing services; floating crane services; and rigging services.

Table 3.20 summarizes the support provided by the SRF to non-federal activities between FY91 and FY95.

Table 3.20
SRF Miscellaneous Support to Non DoD Activities
(Mandays)

Agency	FY91	FY92	FY93	FY94	FY95
GPA	158	129	207	251	1,161
PAG	24	29	37	40	419
GWA	0	1	0	0	2
Commercial Firms	512	485	491	508	515
Totals (Mandays)	694	644	735	799	2,094
Totals (Manyears)	3	3	3	4	10

These figures suggest that approximately 4 manyears of work should be used as a planning factor for the short-term for non-DoD work. The potential for greater volumes

of work are promising, however, in that a commercialized SRF would not be restricted in performing work in competition with other private entities, in contrast to the restrictions placed upon a Navy SRF.

3.4.2.6 Foreign Military Sales (FMS) Program. As a result of the downsizing of the U.S. Navy's surface fleet, a substantial number of excess naval vessels are either being sold or leased by the United States to foreign governments. In consideration for the transfer of these ships, Congress has specifically mandated that all repair and refurbishment of transferred vessels be done in a U.S. shipyard, either private or public. The FY96 Defense Authorization Act in part, sets forth the following:

> **Section 1012 (f). Repair and Refurbishment in United States Shipyards.** — The Secretary of the Navy shall require, as a condition of the transfer of a vessel under this section, that the country to which the vessel is transferred have such repair or refurbishment of the vessel as is needed, before the vessel joins the naval forces of that country, performed at a shipyard located in the United States, including a United States Navy shipyard.

For purposes of this Act, SRF Guam qualifies as a shipyard located in the United States. Accordingly, a privately operated, commercial SRF will be able to compete for the repair and refurbishment workload to support the increasing needs of the foreign military sales program. This repair and refurbishment is generally limited to making the transferred vessel mechanically operational. Even this limited scope of work typically results in "work packages" that are 30 to 40 million dollars per vessel—a substantial amount of work.

Because the recipient country is responsible for paying for the refurbishments needed prior to transfer, it has the opportunity to specify the U.S. shipyard where such work is to be performed. To date, such a preference, however, has not been usually expressed. As a result, the Naval Sea Systems Command (NAVSEA) has, as a rule, assumed responsibility for awarding a contract for the necessary shipyard services.

In the past, commercial shipyards in the vicinity of San Diego and Long Beach Naval Shipyards have performed refurbishment work for ships purchased by Taiwan. Currently, Newport News Shipbuilding in Virginia is performing overhaul work on a ship purchased by Taiwan. Recent closures of four of the Navy's mainland shipyards probably eliminates the remaining Navy shipyards from the Foreign Military Sales (FMS) market because of their lack of capacity and high production rates. Estimates production rates for the three remaining Navy shipyards that could refurbish FMS vessels are:

Puget Sound Naval Shipyard, Washington	$466 per day
Norfolk Naval Shipyard, Virginia	$484 per day
Pearl Harbor Naval Shipyard, Hawaii	$734 per day

To be competitive, shipyards seeking FMS work, to include a commercialized SRF Guam, as a minimum must have cost structures that are similar to commercial ship repair firms in stateside locations, even though these rates are higher than most ship repair facilities located in Asia.

Unquestionably, the foreign military sales program and the pre-transfer repair and refurbishment requirement creates an exciting opportunity for significant workloads on a privately operated, commercial ship repair facility. The substantial nature of the work packages could entice investors and/or shipyard operators, domestic and foreign, to participate in the operation of Guam's SRF. If one assumes that approximately 70 percent of a archetypal $30 million work package is attributable to labor—30 percent of the costs being material and equipment—there is, say $20 million of required labor effort per vessel. At $350 per manday, this represents approximately 57,000 mandays or 270 manyears of effort per vessel. If one further assumes that the repair takes one to two years, then the manpower requirements for the SRF would be between 135 and 270 personnel.

Of particular note is that Taiwan is projected to be a major recipient of excess vessels. For example, three *Knox* class frigates are projected to be transferred to Taiwan in fiscal year 98. A marketing effort, aimed directly at the Government of Taiwan and Taiwanese shipyard/ship repair operators, could result in expressions of keen and intense interest. Since the frigates will become the property of Taiwan, it would be in their best interest to participate actively in their repair and refurbishment. Moreover, if the pre-transfer work is performed by a Taiwanese operator, or by a commercial SRF entity that is funded, at least partially by Taiwanese investors, the potential for the work to be expanded beyond the minimum required by U.S. law is greater. Such conditions could in turn, lead to the creation of more shipyard jobs.

3.4.3 The Fishing Industry

The appearance of sizable commercial activity in Apra Harbor is a relatively recent phenomenon. Guam's tuna industry developed beginning in the mid-1980s when longline tuna boats began off-loading sashimi grade tuna for grading, packing, and transshipment via wide-body jets to fish auction markets in Japan. By the late 1980s, Apra Harbor had become the home port for over 200 tuna vessels, including both (sashimi grade) longliners and (tuna for canning) purse seine vessels. In 1991, air-transshipment of sashimi grade

tuna from the Micronesian islands through Guam, to Japan was initiated. Most recently, in March 1995, Casamar joined with American President Lines in shipping frozen purse seiner tuna from Apra Harbor to canneries in Bangkok, Thailand. The presence of both longliners and purse seiners has created a demand for a range of services within Apra Harbor, including vessel maintenance, net repair, and hydraulic repair services, in addition to warehousing, salt, ice, fuel, and provisioning.

3.4.3.1 Longliners. The rise of longline tuna catch being transshipped through Guam is the more recent result of fundamental changes in Japan's import market relating to new trade agreements and rising incomes in that country. Economic prosperity and rising personal incomes in Japan increased its demand for luxury goods such as sashimi tuna in the latter half of the 1980s. The costs of operating Japan's domestic tuna fleet continue to escalate, and maritime zone claims by Pacific Basin countries are excluding some Japanese longliners from traditional fishing grounds. As a result, Japan is relying more on imported tuna to meet its demands for sashimi, and there is a growing tendency for fresh tuna to be transshipped to Japan from many foreign ports of landing.

Guam has become a major transshipment center because of:

- A relatively well developed port
- Excellent air cargo service to Japan
- Proximity to the rich tuna fishing grounds in the waters of the FSM
- Availability of relatively low cost (and low tax) vessel fuel
- Well-established marine supply/repair industry
- Recreational amenities for crew shore leave

Foreign-flag longline vessels—mostly Japanese and Taiwanese—fish at latitudes between 2° and 11° N. After a 3-4 week trip, they offload their catch, primarily of bigeye and yellowfin tuna, at Apra Harbor. The tuna is then air freighted to Japan's sashimi market, with the exception of fish which do not meet quality and size standards.

The 1994 total transshipment of 11,170 metric tons of fish off-loaded from longline vessels, though considerably less than the peak 15,000 metric tons shipped in 1989, represented a significant 57 percent increase from 1993. Of even greater encouragement was that it was more than double the transshipment recorded in 1992, when only 5,390 metric tons were recorded.

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Table 3.21
Guam Tuna Transshipment Totals
(Metric Tons)

Species	1989	1990	1991	1992	1993	1994
Albacore	3.00	2.21	0.57	0.78	5.79	16.39
Big Eye	7,950.00	7,023.61	4,641.92	2,898.45	3,693.46	4,449.32
Yellow Fin	6,372.00	5,088.56	4,809.98	2,258.58	3,066.38	5,961.89
Black Marlin	300.00	248.30	171.18	77.95	132.58	155.67
Blue Marlin	300.00	176.68	179.13	127.22	165.62	274.75
Striped Marlin	15.00	2.73	6.02	4.77	24.88	24.54
Swordfish	15.00	9.59	5.07	6.75	9.09	22.76
Other	45.00	32.29	22.84	15.17	6.45	264.67
Totals:	15,000.00	12,583.97	9,836.71	5,389.66	7,104.25	11,169.97

Beginning in 1992, Guam's role as predominantly a transshipment center for tuna off-loaded at Apra Harbor began to change. In that year small "collector or feeder" aircraft began transporting fresh tuna from FSM and Palau to Guam's Agana Airport for further shipment to Narita Airport in Tokyo, Japan. The decline in port calls (see Table 5.7) by longline vessels resulted in protests by the Government of Guam against the land locally policy adopted in June 1991 by the FSM. The controversy was further fueled by a perception that air cargo space on jumbo jets carrying tuna to Japan was being taken up by fish coming into Guam on feeder aircraft. By 1993, however, the downturn in port calls by longliners reversed.

Guam benefits from the foreign longline tuna transshipment industry in the form of

- Employment of Guam residents—approximately 250 jobs supported the longliner and purse seiners in 1995
- Spending on Guam—estimated to be $43,600,000 in 1995
- Tax revenues—approximately $4,100,000 in 1995

Each longliner port call was estimated to result in a total direct expenditure of $21,522 in 1995 as shown in Table 3.22.

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Table 3.22
Estimated Direct Expenditure Per Longliner Port Call, 1995

Crew Cash Advance	$2,400
Fuel and Oil @ .70/gallon	4,000
Provisions	2,450
Unloading (including grading, packing, and trucking of tuna)	1,930
Transshipping	8,200
Telecommunications	250
Vessel Agent Fees	140
Port Charges (includes customs and quarantines)	581
Repairs	18
Other expenses*	1,553
Total:	**$21,522**

* Includes ice, bait storage, propane, dry ice, gel ice and packing materials, medical, crew reparation/documentation/travel

In addition to the obvious opportunity to increase expenditures by encouraging greater numbers of port calls, transshipments, and number of vessels homeported at Apra, the following areas are worth discussion:

- Opportunity for Employment as a Longliner Crewmen. As a rule foreign longliners do not provide crewing opportunities for local fishermen. Typically, half the crew is from the vessel's home country with the remainder coming from Indonesia and the Philippines. The latter are hired at fixed wages of $250 to $350 per month, wages that are too low to attract Guamanian interest.

- Opportunity for Investment and Expansion in Support Services. It is important that, inasmuch as Japan's consumption of sashimi defines this product market, the market's relative instability be kept in mind. If as some forecast, the number of longliners in the regional waters around Guam rises to over 1,000, the demand for port fishing facilities will rise sharply. These supporting ancillary facilities include, but are not limited to:

  - General service equipment such as cranes, forklifts, trucks
  - Cold storage facility for bait storage, reject tuna storage
  - Fish processing, e.g., fish jerky from reject fish

  - Ice plant, salt storage
  - Administrative areas, office space, ship and fishermen's storage, showers

- Opportunity for Increased Government Revenue. Fuel sales to commercial fishing vessels were exempt from liquid fuel and gross receipt taxes in 1991. If the exemption were reconsidered, considerable revenue could be generated by taxing the sale of fuel to longliners (and to purse seiners).

- Opportunities for U.S. Longline Vessels to be Based in Guam. Development of Guam as a base for U.S. longliners could result in increased economic benefit to Guam, especially since U.S. longliners contribute more significantly to the economy than foreign longliners. U.S. vessels would be more likely to relocate their families and to purchase the majority of their fishing supplies in Guam. Guam residents may be interested in participating in the industry as owners.

Among the factors that will affect Guam's competitive position and future role in fresh tuna transshipment are:

- Sustainability of the fish catch in the Western Pacific. While there is no evidence that the increased longline and purse seine fishing efforts are depleting the fishing supply, continued growth, particularly in purse seiners, could lead to a decline in the rate of yellowfin tuna catch.

- Changes in revenue and cost factors. Fresh fish transshipped from Guam are the low and medium grade yellowfin tuna which are highly susceptible to price fluctuations due to supply variations and to the U.S. dollar/Japanese yen exchange rate. Slight changes in one or both have an almost immediate impact on demand. Other cost elements with significant effect on Guam's attractiveness are fuel (fuel is cheaper in Guam than in FSM making the longer voyage to Guam from the FSM fishing grounds acceptable) and air transshipment (transshipment costs are lower in Guam than from the FSM or Palau making it more advantageous than shipping from facilities closer to the fishing grounds).

- Government policies. Longliners which transship tuna from Guam are generally licensed to fish in the FSM. Technically, FSM licensing policies require that all fish caught in their EEZ be transshipped out of FSM ports. Moreover, in June 1993, transshipment in the high seas was generally banned. Hence, all vessels with fishing agreements must now transship at ports designated by the countries under which they are licensed. Only because FSM ports are currently under-developed (and air cargo service insufficient), are transshipments still occurring in Apra Harbor. A regional agreement is sorely needed.

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- Japanese Government policy regarding longline vessels. While the Fishery Agency of Japan (FAJ) has in recent years allowed more longliners to transship from Micronesia, in the past it dictated strict quotas on the number of longliners permitted to use foreign ports for transshipments. If Japan were to revert to its past policy, Guam's fish transshipment industry would be adversely impacted.

- Changes in regional port infrastructures. As the port infrastructures in Micronesia develop, longline fleets may find it less attractive to transship or home port out of Guam. All four states of the FSM, the Marshalls, and Palau are planning to expand their port infrastructures. Saipan is expanding their main harbor. Fishing vessels currently using Wharf F-3 as their principal dock may find these other ports more attractive if the Port Authority of Guam cannot improve the existing facilities.

- Changes in air cargo service. Present conditions provide substantial advantage to Guam. Changes to the status quo, however, could be detrimental to Guam as an air transshipment center. While there are some private chartered flights being used for transshipments, the majority of the fish are being transshipped from Guam and Saipan. Commercial transshipment rates from FSM or Palau, should direct flights be initiated, would be higher than from Guam, thus giving Guam a competitive advantage. Even if a private freighter were to operate regularly out of the FSM or Palau at consistently full capacity, its rate structure would not be as economical as that provided by Continental Air Micronesia from Guam to Narita.

Guam has adopted an ambitious strategic plan. Known as Vision 2001, encompasses targets and goals in a number of economic sectors, including tourism and fisheries. One goal of particular significance to the longliner industry is that of doubling tourist arrivals by 2001. That goal in turn calls for significant expansions to Guam's airport and harbor. A rise in tourism and an increase in the air terminal capacity will result in increases in the capacity to handle larger quantities of fresh fish exports to major Asian markets. To the extent that the Western Pacific waters can sustain a higher yield of tuna, and the Japanese consumer market demand responds to the increased supply, Guam's increased harbor and airport capacities will ensure the future growth of the longliner fisheries trade.

Finally, in addition to direct transshipment of medium-grade sashimi tuna to Japan, a second operation has also been recently initiated—that of removing the heads and guts from low-grade longline-caught tuna, then air freighting them to Europe via Korea. While the operation is still in its infancy, it merits careful monitoring as it could serve to diversify the tuna transshipment industry and to attract even greater numbers of longliners to Apra Harbor.

3.4.3.2 Purse Seiners. 1995 saw a 64 percent increase in the number of purse seiner calls at Apra Harbor from the previous year, establishing a record at 330 visits as compared to the 201 vessels that called in 1994. The purse seiner industry has not been, until recently, based on transshipment. While some transshipment has taken place in Apra Harbor with reefer vessels taking tuna directly from the seiners, most of the seiners calling at Guam had transshipped their fish in Tinian in the CNMI. The seiners came to Guam to service their nets, perform minor ship repairs, and for crew R&R (rest and recreation).

The situation began to change in March 1995, when Casamar, Inc., a vessel maintenance company, began shipping frozen seiner tuna to canneries in Bangkok under a joint venture program with American President Lines (APL). During 1995, the Casamar/APL operation shipped over 28,000 tons of tuna to Thai packers. Reportedly, the joint venture has the capacity to eventually transship up to 100,000 tons a year of frozen tuna using APL's refrigerated containers.

The refrigerated container operation is attractive for several reasons

- It is estimated to be 35 percent cheaper than shipping via a reefer vessel.
- The canneries find the 25-ton refrigerated containers to be easier to handle and to integrate with locally procured fish than an entire refrigerated vessel of frozen tuna.
- APL finds the arrangement attractive because it allows loaded refrigerated containers to be backhauled to Asian shipping markets. In the past, these containers had been backhauled empty.

Although the number of purse seiner calls is far less than the number of longliner calls, and although much more attention has been paid to the longline industry than to the purse seiner industry, the facts are that in comparative terms, Guam benefits far more from the purse seiners than from longliners. In 1995, the total spending that had been generated by the 330 purse seiner calls was estimated to be $156,710,000, versus the estimated $43,625,000 that had been spent by the 2,027 longliners that had called on Apra Harbor. Recognizing the potential economic benefits, beginning in 1994 the Port Authority of Guam granted a temporary one-year waiver of port charges to encourage more purse seiners to home port and provision in Guam. The immediate result was a significant rise in purse seiner calls the following year.

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Earlier, Table 3.22 showed that an average of $21,522 was expended in Guam per longliner call. In comparison, Table 3.23 shows that on a per vessel basis, 2,100 percent more was spent by a typical purse seiner.

Table 3.23
Estimated Direct Expenditure Per Purse Seiner Port Call, 1995

Crew Cash Advance[1]	$81,000
Fuel and Oil	155,000
Provisions	40,000
Unloading	3,150
Transshipping	36,750
Telecommunications	2,000
Vessel Agent Fees	3,500
Port Charges	4,000
Repairs[2]	62,000
Other Expenses[3]	87,500
Total:	**$474,900**

[1] Based on $3,000 for 27 crew members

[2] Includes net repairs

[3] Includes salt, travel, supplies and tools, freight charges, helicopter repair and maintenance, other vessel expenses

While Guam's purse seiner operations are small by comparison to the tourism industry, and generate fewer jobs than longliner fishing, it has a greater monetary benefit than the longliner trade and, perhaps, greater potential. It has been estimated that the total revenue generated in the Western Pacific from fisheries totals $4 billion. Yet, only a barely consequential 1.5 percent is currently being retained within the Western Pacific nations—much of the income goes to those who own the vessel fleets, the canneries, and the distribution networks.

In order to increase their share of the earnings, it has been argued that the Pacific nations must agree to a much more closely integrated regional cooperative arrangement to control the industry. At least one proponent of the concept theorizes that if the consortium of nations would agree to distribute specific industry roles and share benefits, much more of the revenues would be available to those who own the resources, i.e., the fish in their EEZs. Conceptually, the theory is that each member nation would play a specific role in the industry—some would own licensing rights, others canneries, ship repair, ship building, transshipment, fueling, and similar functions. By banding together, the terms of

the fishing license would dictate that fish must be landed at a specific location, cleaned for transshipment, transshipped for processing at a different location, and so forth. Ultimately, the concept requires the fishing vessels to not only be repaired, maintained, and provisioned within the consortium of nations, but also to be built by one or more of the consortium countries.

Establishing a consortium will not be a trivial undertaking. And, Guam's role, given its lack of fish and high labor costs, is not obvious. Certainly, its clear advantages include its excellent harbor and infrastructure potential, low fuel costs, air transshipment, and as an R&R center. It could even develop a cannery, if the labor-intensive loining operation—cleaning and preparation of the fish—were done elsewhere and the canning itself performed in a highly automated modern facility for market distribution.

Guam has recognized the need to diversify its one-industry—tourism—economy. Defense cutbacks will continue, albeit at a slower pace. It is important then, that the promise of a substantial growth in the purse seiner industry not be dismissed merely as a result of perceptions and stereotypes of "dirty work" and "environmentally damaging canneries."

3.4.4 Tourism

The first scheduled flight of Pan American World Airways from Japan landed in Guam in 1969. At that time, Guam had only one tourist hotel: The Cliff Hotel. From that humble beginning, Guam's tourist industry has grown to host more than 7 million visitors of all nationalities.

Within the Pacific Basin, more tourists visit Guam than any other nation. In 1993 for example—the last year for which complete figures are available—Guam captured 37 percent of all tourists to the Pacific.

The percentage of visitors to Guam in all likelihood increased significantly in 1994 when Guam drew, for the first time in its history, over 1,000,000 visitors (records for 1994 are not available for the entire Pacific Basin), and in 1995 when an estimated 1,400,000 visitors came to Guam

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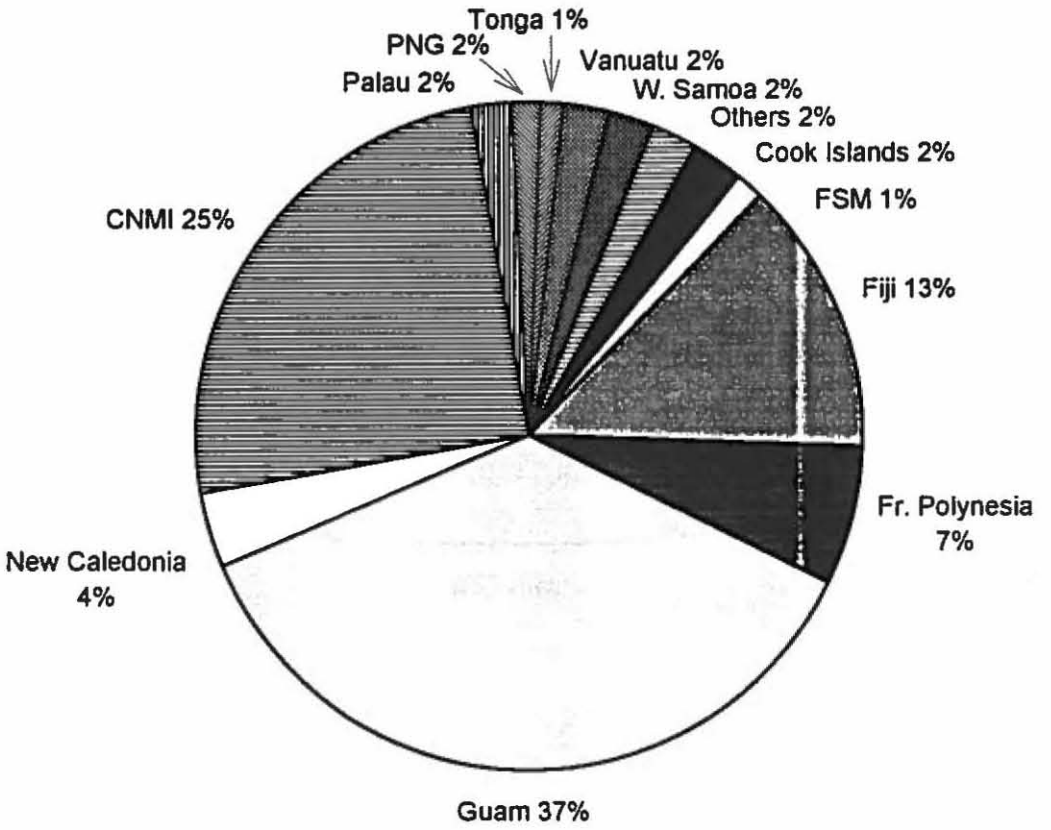
Figure 3.8
Pacific Island Tourist Destinations, 1993



The demographics of the Guam visitor industry provides a wealth of clues to assess the tourist market demand. In 1994, the last year for which complete statistics are available, the total number of visitors to Guam was 1,076,437. Of this number, the largest single group came from Japan—773,349—followed in the distance by Korea who sent 118,538 visitors. Although the percentage of Japanese visitors, 72 percent, appears high, it actually represents a drop from 83 percent in 1990. The complete breakdown is shown graphically in Figure 3.9.

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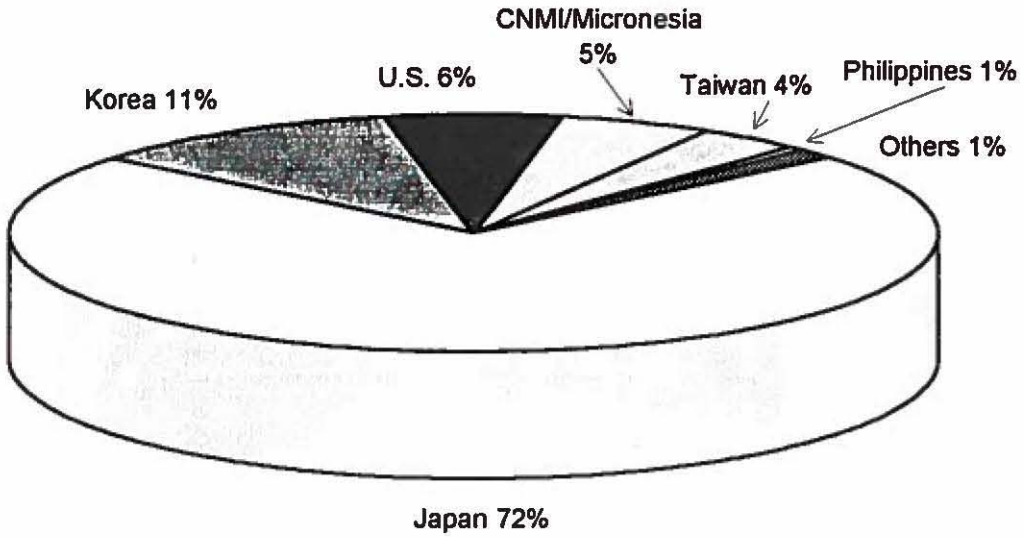
Figure 3.9
Guam Visitor Demographics, 1994
Source: Guam Economic Review



Exit surveys conducted by the Guam Visitors Bureau allow a more detailed analysis of tourist behavior.

- Japanese Tourists (based on June 1995 exit survey)
  - Over half the Japanese visitors are women. The ratio is even more pronounced in the younger the age groups. "Office ladies" constitute a significant proportion of the total number of visitors (24 percent).
  - Japanese visitors are almost evenly split between those married and single.
  - Average incomes were quite low. Only 13 percent of the sample had incomes that exceeded $65,000 (@ ¥108=$1)

- The main purpose the visit was *pleasure* with *reasonable tour price* being the number one reason for coming to Guam.

- Other travel destinations the visitors had experienced were commonly Hawaii, Okinawa, Korea, Hong Kong, and Singapore.

- Optional tours (activity tours) are very popular with this group. Shopping, while considered expensive, was another favorite activity. With regard to future attractions, casino gambling is a consistent recommendation, followed by aquariums, "water slide" parks, and sporting events. Clearly, Japanese visitors are activity-oriented.

- Japanese visitors spent an average of $798 over and above prepaid items for such items as airfare, hotels, selected meals and tours. Of the total additional spending, 57 percent ($451) was for local shopping followed by 19 percent ($152) for local tours.

· Korean Visitors (March 1995 survey)

- Like the Japanese, the visitors are young. Eighty four percent were in their 20s and 30s. 60.2 percent of the visitors were honeymooners.

- Unlike the Japanese, over 90 percent of the visitors were married. Two-thirds of the visitors were male.

- The largest occupational group were "salarymen" at 46 percent, followed by business owners and professionals at 12.9 and 11.7 percent respectively.

- Slightly more than half the visitors reported their annual incomes as between $12,000 and $24,000.

- The preferred travel arrangement is the package tour with only 13 percent making independent travel arrangements.

- The primary reason cited for coming to Guam was to enjoy the "beautiful seas/beaches/tropical climate."

- City sightseeing, dinner shows, jet skis, and shopping were the favorite activities of this group. With regard to future attractions, nature/hiking trails, aquariums, water slide parks, and theme park scored high in wants.

- Koreans spent an average of $497 on island. About 95 percent of the visitors shopped while in Guam and spent an average of $297 per person making that the largest local expense. Local tours at $201 average was another high expense item.

While Japanese visitors are expected to continue to grow at about 5.5 percent annually, Guam is steadily diversifying its visitor base. The number of Korean arrivals in 1994, for example, represents a 73 percent increase from 1993, and those from Taiwan grew by 65 percent, on top of an 83 percent gain in 1993.

Based on the nature of Guam's tourist industry, and the wants and needs as expressed by the visitors themselves, pursuit of several tourism market segments are worthwhile. These areas—hotels, retail sales, theme park/water park/aquarium, dinner cruises and excursions, cruise ship travel, and casinos—are discussed in the following sections.

3.4.4.1 Hotels. Responding to rapid growth in tourist arrivals, the number of hotel rooms reached 6,153 in 1994, a significant increase over 5,552 a year earlier. Two-dozen major hotels are clustered along the island's northwest coast along Tumon Bay and Tamuning. Hotels are beginning to edge their way into Agana Bay as well. Occupancy rates remained healthy at 71 percent in 1994 for a third consecutive year, and occupancy taxes brought in nearly $13.7 million.

Vision 2001, Guam's strategic vision statement, calls for increasing tourist arrivals to 2 million per year. That number translates into 20,000 on-island visitors on any given day requiring 12,000 hotel rooms. According to Vision 2001, about 5,600 additional rooms are needed as shown in Table 3.24.

Table 3.24
Vision 2001 Hotel Room Requirements
Source: Vision 2001

	1996	1997	1998	1999	2000	2001
Existing Rooms	6,387	7,219	7,890	9,150	10,200	11,590
Under Construction	633	491				
Projected New Constr	199	180	300	600		
2001 Hotel Rooms			960	450	1,390	410
Total Rooms:	7,219	7,890	9,150	10,200	11,590	12,000
Visitors (000)	1,355	1,481	1,717	1,915	2,175	2,250

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Current strategy suggests that the majority of this development continue to occur at Tumon Bay—where Guam has invested virtually all of its tourism infrastructure. But, Tumon is crowded, and land is expensive. Moreover, new tourist attractions are being located farther away from the central Tumon area, for example, the Piti Underwater Observatory. Others are being proposed to be in the Apra Harbor area, Baldyga Group's Paradise Island, for instance. Hence, the opportunities for hotel development within the BRAC properties should not be discounted.

3.4.4.2 Retail Sales. There is apparent merit to the contrarian view to "forget the beaches, resorts, and eco-tourism—tourists want to shop till they drop." The new phenomenon of "retail-tourism," where shopping becomes the main, if entire draw for travelers, is alive and well in Guam. The exit survey results of Japanese and Korean tourists show it, and the sales results from Guam's K-Mart proves it.

Guam offers the world's largest K-Mart. Opened in May 1995, the store has proven to be a major draw for tourists. Unlike traditional K-Marts, the Guam store offers *Givenchy* perfume, *Courvoisier* liquor, $299 bottles of *Landy* cognac, and *Movado* watches at $763. Not to be outdone, Duty Free Shoppers Galleria plans to double in size to 110,000 square feet by March 1997. Gibson's, a mainstay in Guam for many years, recently announced its sale to the owners of Hawaii's highly successful Waikele Center. The new owners intend to convert it into Guam's first factory outlet. Judging by the success that Waikele in Hawaii has enjoyed with Hawaii tourists, the new outlet is virtually a sure success.

Shopping is particularly attractive in Guam because the products are duty-free. Retailers claim that for some travelers, the savings can even equal the cost of the vacation itself. Considering that 3-night, 4-day packages from Tokyo are available for less than $500, many visitors are given the tours as a reward for good work by their companies. The Japanese, who constitute over 70 percent of the tourists, are young, affluent, and eager to shop. An abundance of U.S. and European products at tax-free prices just 3-½ hours from Tokyo is a sure tourist success.

The market for retail sales is still in its infancy.

3.4.4.3 Theme Park/Water Park/Aquarium. One of the immediate development challenges facing Guam in expanding its tourism sector is to find additional lucrative activities to help draw more visitors and keep them for longer periods. Vision 2001's

tourism strategy calls for the development of two major tourist attractions. After surveying over 2,000 respondents, tourists indicated a preference for:

- Aquariums
- Water Slide Park
- Theme Park
- Sporting Events
- Gambling Casino

Similarly, tour agents indicated a preference for:

- Sporting Events
- Gambling Facility
- Aquarium
- Theme Park
- Water Slides Park

Of the tourists sampled, over 85 percent indicated that they had visited an aquarium elsewhere, and 72 percent were interested in visiting an aquarium on Guam. Although a new underwater observatory has recently opened in Piti, the facility is relatively limited as a venue, and it cannot offer the full spectrum of marine life that an artificial aquarium environment can. Yet, its success so far would seem to indicate that a marine-oriented tourist attraction, such as a more traditional aquarium could prove alluring.

Constructing a new, viable tourist attraction, however, will not be easy. Among the largest considerations are the following factors:

- Volume and Rate: Most tourist attractions rely on high volume to generate sufficient revenues. For example, the Singapore Tunnel Aquarium has an attendance record of over 1.6 million visitors per year—more than the total number of visitors that come to Guam today. The entrance fee is $8.40 per person, while their market share is 24 percent of the total visitor count of 7 million.

  Assuming a Guam "aquarium" attraction can attract the same 24 percent of its say, 1.6 million visitors, the entrance fee would have to be $40 per person.

- Population Base: Guam has only 150,000 full-time residents. Most U.S. attractions rely upon a sizable local population base to support the attraction and to offset fluctuations in tourist demand. Typically, a sizable portion of an attraction's fixed costs are covered by revenues from the local population while the profits are generated from its visitor base. Guam's low population would make that difficult.

- Cost: Guam's Tourism 2001 Task Force suggested the construction of an aquarium at an estimated cost of $15 to $20 million based on concepts similar to those employed in Brisbane, Australia; Perth, Australia; or Sentosa Island, Singapore.

  A water slide park at the Onward Agana was recently opened at a cost of $30 million. The Japan Plaza plans to open a $10 million water slide in mid-1997.

  A full-scale water theme park like Sea World in San Diego would likely prove cost prohibitive for Guam's relatively small user base. Sea World's replacement cost is estimated at $200 million. A smaller initiative, such as Hawaii's Sea Life Park at $50 million replacement cost, may be more realistic.

Despite these challenges, at least one developer, Baldyga, has shown a specific interest in developing a theme park/waterpark/aquarium in the Apra Harbor vicinity. Specifically, he has approached the LRA and the Port Authority with a proposal for the development of Drydock Island to create a large water venue. Combining elements of a water show (complete with dolphins), a cultural center (displays and exhibits of a variety of Micronesian cultures), aquariums, and bird displays, along with shopping, dinner cruises, and other more traditional attractions, Baldyga's proposal would convert the currently largely unused property into a major tourist venue using private funds.

3.4.4.4 Dinner Cruises and Day Excursions. Creation of a successful tourist focal point in Apra Harbor would require the development of an attractive ambiance based on a nautical theme. Such an area could be developed along the lines of San Francisco's Fisherman Wharf, San Diego's Seaport Village, or Honolulu's Aloha Tower Market Place. The area would be a mixed-use area, jointly used by international cruise ships, retail sales, restaurants, sporting activities, and excursion operators of day and dinner cruises.

One expressed need is for improved facilities for Guam's Charter Boat Industry. The Guam Charter Boat Feasibility Study initiated by the Department of Commerce showed the relative merits of expanding facilities to increase the capabilities available by Guam's existing infrastructures. The study concluded that the industry needs upgraded marinas,

adequate drydocks, and other support facilities to truly promote the industry. Portions of Apra Harbor could service that need.

Aquatic excursions in the form of diving trips, snorkeling expeditions, day cruises, and dinner cruises are extremely popular with Guam's tourists. Boats with capacities that range from 20 to 150 passengers currently service the tourists from scattered and generally unimproved docks—Pier Dog, Hotel Wharf, Wharf F2, and parts of the Harbor of Refuge. None of these areas are satisfactory.

One area under specific consideration to service dinner cruises is Drydock Island, in combination with other tourist-oriented attractions. Other areas under consideration include portions of Uniform and Victor wharves in the Inner Harbor, as well as improved facilities in the Harbor of Refuge. Water-specific tourist activities such as day excursions, fishing trips, diving, and the like bring tourists to a specific location to participate in the activity. Properly planned, the activity can be integrated with other supporting functions, such as retail sales, to provide increased benefits through combined services.

Typically, a fishing boat charter consists of two to four passengers and lasts four to six hours. Excursion boat trips carry up to 50 passengers and average two trips per day. Bad weather and maintenance needs suggest that these are, at best, a 300-day per year activity. According to recent exit surveys by the Guam Visitor's Bureau and surveys performed as part of the Charter Boat Fishing Study, fishing charters capture about 2 percent of the tourist volume whereas excursion boats capture about 16 percent. Based on these figures, the expected tourist volume can be estimated as:

50 fishing boat charters @ 4 people each	=	200 people per day
15 excursion boat trips @ 50 people each	=	750 people per day
Total:		950 people per day

Improved port infrastructures, better facilities, and increased variety of services and tours could increase the relatively low density of interest.

3.4.4.5 Cruise Ship Travel. Guam is currently called upon approximately 30 times per year by an average of 15 separate international passenger ships. According to the Guam Visitor's Bureau, most of the visits are academic in nature—the vessels bring about 600 students during their winter vacation who spend the 5 days transit in various classroom or marine study activities.

Cruise vessel arrivals tend to be bunched both in terms of the time of year and day of call. In 1989, three vessels called within two days in January. But, two vessels called on

one day only one other time—in May with 520 passengers each. The heaviest passenger traffic occurred in January, March, June, and December, but the heaviest ship traffic occurred in January, March, August, and December, when three ships called each month. The patterns have altered only slightly since, and aside from the tendency for some ships to call on the same day, there appears to be little pressure on the Port at present for greater capacity. Only the quality of the infrastructures and transportation facilities need to be improved. Typically, passengers steam to Guam, then fly back to Japan.

After rising quickly to a record of 13,668 seaborne passenger arrivals in 1992, arrivals declined to under 9,000 in the two following years, and recovered to just over 10,000 in 1994. The volatility and lack of consistency makes it difficult to determine trends. The determinants of the level of traffic in this market tend to be dictated by the nature and attractiveness of ocean destinations along with which cruise ships wind their way to the destinations. Current estimates are that the number of cruise vessels plying the Asian waters will be growing rapidly for the foreseeable future. It is not clear whether the rather modest increase in such vessels calling on Guam since 1989 is a reflection of market preference or mere convenience of entry.

Asia's total cruise activity is not likely to triple before 2020. At most this would mean major foreign cruise vessels calling an average of one per week (52 per year) rather than the current average of about one every third week (20 per year). At 52 ships per year, with each ship carrying 500 passengers, and assuming $20 per passenger in port charges, the total revenue to Guam could be about $520,000.

In spite of the tendency of these cruises to concentrate in just a few months of the year, this would be an increase in demand that could possibly be met with improvement of existing docks. Moreover, there is some evidence to suggest that the number of arrivals is restrained due to the lack of adequate infrastructures to support international cruise ships—it has been reported, for instance, that Club Med terminated its visits to Guam for that reason. Aggressive marketing and selected port improvements could increase current seaborne tourist arrivals.

3.4.4.6 Casino Gambling. Casino gambling, a politically sensitive issue with significant potential sociological implications, nevertheless can be a significant tourist attraction and promote the general economy of Guam. Exit surveys of Japanese tourists, who represented 72 percent of all visitors to Guam in 1994, consistently show gambling facilities at or near the top of the list of "wants."

To alleviate community concerns over its potential detrimental influences, casino gambling could be restricted geographically, for example in a portion of the to-be-released

naval properties within Apra Harbor. Casinos in Apra Harbor would also be attractive in that it would force a separation of the more traditional tourist attractions in the Tumon Bay area from the gambling facilities. Thus, tourists not interested in gambling, or concerned about gambling's potential influence on the young, would continue to enjoy activities in the Tumon Bay area, while those who seek the thrills of gambling would cater to the Apra Harbor area. The physical separation facilitates the development of two very different tourist attractions as those interested in gambling as an activity may not be interested in say, water sports, and vice versa.

Casino license fees could fund other tourism infrastructures or other Government of Guam needs. Casino license revenues for the city of Cairns, Australia, with a population roughly the same as Guam and similar visitor traffic, is reportedly about $35 million per year. For Cairns, the collected fees are sufficient to fund the construction of a $30 million convention facility capable of accommodating 2,000 to 3,000 visitors. Queensland, Australia, as another example, has been able to provide for infrastructure development—including parks and recreational facilities—while avoiding the corruptive attraction of underworld organizations.

3.4.4.7 Summary. While the future political status of Guam may be uncertain, the island's economic future will be inextricably tied to mass tourism appeal and the secondary and tertiary benefits that it brings to related services and industries. Japan, Korea, Taiwan, China, and the Philippines will be Guam's major sources of tourists.

Apra Harbor is one of the few commercial ports in the world that offers quality diving and snorkeling opportunities. It contains a live reef ecosystem, along with interesting shipwrecks of historical significance, to be alluring to tourists and professionals alike.

The return of facilities in Apra Harbor presents a unique opportunity for Guam to capitalize on developing it as a second major tourist attraction—after Tumon Bay. The area could be developed as a mixed-use facility with strong nautically-oriented tourism theme. To succeed, though, it is imperative that the area be developed to attract a critical mass of visitors to ensure economic sustainability. Tourist facilities including those for new hotels, retail sales establishments, theme park/waterpark/aquarium, dinner cruises and day excursions, international cruise ship travel, and casino gambling must be smartly integrated. A sound mixture of revenue generating facilities, along with those that are not likely to immediately generate profits, are required.

According to a report titled, "The Economic Impact of Tourism in Guam," by Gary Hiles (Senior Economist at the Department of Labor) and Rodney Webb (an economics consultant with the Guam Finance Commission), every dollar of tourist expenditure

results in a contributes $2.00 to the general economy of Guam. The reason is that money spent in hotels, for example, is re-spent by the hotels in other businesses such as food, laundry services, advertising, and so forth. The total revenue to all businesses is multiplied by the number of times the funds circulate every time this money is re-spent in the Guam economy. The greater the number of times the money circulates in the economy, the higher the multiplier effect. The multiplier effect, however, does not continue indefinitely, as the money eventually flow out of the economy to pay for imports and other off-island expenses.

Hence, if one were to estimate that the combined development in Apra Harbor generates, say, $200 million per year in revenue, not a totally unrealistic scenario, the total value to Guam's economy is about $400 million. Gross Revenue Tax itself will be $8 million, and if the enterprises realize a net income of say, 10 percent or $20 million, income taxes will be $6 million. These are not trivial numbers. While Guam diversifies its economic base, it must not neglect its principal source of income, tourism.

3.4.5 Small Market Segments

3.4.5.1 General. The Navy has determined that it has limited needs for several existing functions at the SRF and would desire their joint use until privatization by a Guamanian concern is accomplished. According to the SRF Closure Plan, the "Navy is interested in privatizing these functions as quickly as possible, with a two year term envisioned as the maximum timeframe for continued Navy support." The proposed joint use functions include the following three small market categories:

- Industrial Chemical Laboratories
- Calibration Facilities
- Hazardous Materials Handling and Storage

In addition, this section includes a study of the market for warehouse space on Guam. Although specific warehouse buildings may not be immediately available as a result of the BRAC closures, disestablishments, and realignments within the Apra Harbor area, this study will review the potential need for additional warehousing.

3.4.5.2 Industrial Chemical Laboratories.

General. The Navy's Industrial Chemical Laboratory is located in Building 2108 on the SRF compound. It is listed as a "Joint Use Function (to be Privatized)" in the SRF Closure Plan. The building is approximately 3,200 square feet in area and is used mainly to support the following three programs:

- Joint Oil Analysis Program (JOAP)—spectrometric/physical testing of petroleum products
- Environmental Testing
- Used (Waste) Oil Testing

A majority of the JOAP workload comes from off-island military functions. Almost all of the environmental testing work is from on-island customers. All of the industrial work is from on-island customers. Laboratory's capabilities include:

- Metal specifications (composition, hardness, and tensile strength)
- Grade B Water Conformance
- Hydrocarbons/Hydrocarbon based material identification
- Aqueous Film Forming Foam (AFFF) mixture analysis
- Chlorination/dechlorination (residual chlorine, bacteria) testing
- Diving/Compressor Breath Air conformance
- Phosphate coating conformance
- Hazardous waste/environmental support consultation (spills, disposals, identifications)
- Polychlorinated Biphenyl Analysis
- Sandblasting grit analysis
- Battery electrolyte make-up solution, sulfuric acid (used/new, concentrated)
- Silver brazing material conformance.
- Babbit/brazing flux solution preparation and analysis
- Wire rope grease conformance
- Plating solution analysis (hexavalent/trivalent chromium, iron sulfuric acid)

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- Nitrogen gas purity (freon, moisture contamination)
- Boiler tube analysis (scales, sludges)
- Conductivity solution analysis and preparation
- Thermal insulating material conformance
- Waste Oil Analysis (heavy metals, TCLP)
- Environmental Testing (EPA SW 846)
- Used Oil and Solvent Conformance (Recycle)
- Chemical solutions, reagent preparations and standardizations
- Chemical Instrument calibrations
- Welding electrode moisture determination.

Industrial/Chemical Laboratory Market. The present workload of the industrial/chemical laboratory is tabulated below:

Table 3.25
NSRF Industrial Laboratory Workload

Customers		Samples Processed	Manhours Expended
JOAP	On Island	779	
	Off Island	2353	
Subtotal		3132	3136
Environmental	On Island	1280	
	Off Island	30	
Subtotal		1310	2072
Industrial	On Island	176	
	Off Island	0	
Subtotal		176	352
	Total	4618	5560

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The industrial laboratory's current customer base is listed below:

JOAP
IXC Guarng
*UMC Camp Fuji-Japan
*ACU 1 Camp Pendleton
*ACU 5
*USS Beaufort
USAR
*COMPLEACT, Yokosuka
SRF Dive Locker
EODMU5 (All DETS)
USS Frank Cable
*USS Pintado
*NAVSUPPFAC, Diego Garcia
NSWU-1
Port Ops NAVSTA
*Special Boat Unit, San Diego
PWC
*USNS Spica
*USS Belleauwood
*USS Brunswick
*USS David R. Ray
*USS Dubuque
*USS Fife
*USS Hewitt
*USS Ft. McHenry
*USS Germantown
*USS LaJolla
*USS McClusky
*USS Mobile Bay
*USS O'Brien
*USS Patriot
*USS Rodney Davis
*USS Tripoli
*USS Galveston
NPS-5

Environmental
MAC Labs
Ambyth Shipping
SRF
PWC Environmental
FISC Fuel
Port Authority of Guam
MSC
NAVACTS
USS Frank Cable
*USS Brunswick
Camp Covington
*USS Kilauea
NSWU-1

Industrial
SRF
USS Frank Cable
Guam Power Authority
MSC
EODM (All DETS)
NSWU-1

* Off Island customers

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Since a majority of the workload is for off-island DoD customers, it is expected that these customers will still require lab work even after the closure of the SRF. The DoD work will provide the necessary baseload for a privatized lab.

There is an interest by one of the current laboratory employees to operate the JOAP program as a private contractor.

3.4.5.3 Calibration Laboratories.

General. The Calibration Laboratory at SRF is also included in the Navy's request for a Joint Use Function. As part of the current SRF's organization, the Calibration Laboratory is a small element of the Electronics Shop (code 930). Located in building 20, the laboratory occupies approximately 3,000 square feet and is completely climate controlled for temperature and humidity to prevent the calibration units from becoming "uncalibrated."

The main workload of the calibration laboratory comes from military customers, including SRF, NCTAMS, Navy SEALS, Naval Magazine, FISC Fuel, CINCPACFLT, USCG, and PWC Guam. The facility is rated as a Type III laboratory, and its capabilities include:

- Calibration of electrical/electronic test equipment
- Calibration of mechanical gages
- Calibration of pressure gages up to 10,000 psi
- Calibration of temperature gages ranging from 400 degrees F to 1000 degrees F
- Calibrate and repair electrical, electronics, physical and diagnostic equipment

Calibration Facilities Market. The present workload of the calibration laboratory is tabulated in Table 3.26. It can be seen from the workload table that the current DoD customer base will require continued services from the laboratory, even after the proposed realignment and closure of parts of Apra Harbor. These Navy customers will need continued support to maintain their equipment on their scheduled calibration programs. Hence, the military market will provide the essential baseload of work to give a privatized calibration laboratory its initial business workload.

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Table 3.26
Calibration Laboratory Workload

Customer	Type	Line Items	Est MH
NAWMU-1	Elect/Elex	98	294
	Mechanical	91	273
	SSP	19	57
Subtotals		208	624
NCTAMS	Elect/Elex	799	624
	Mechanical	65	195
	Lab Stds	89	267
	Security Group	183	549
Subtotals		1136	3408
HC-5	Elect/Elex	3	9
	Mechanical	73	219
Subtotals		76	228
NAVACTS	Mechanical	217	651
Subtotals		217	651
EODMU-5	Elex/Mechanical	1202	3606
Subtotals		1202	3606
	Grand Total	2839	8517

It should be noted that although the laboratory is located on the SRF compound, most of the workload comes from organizations other than the SRF. Climate control is the overriding factor in the successful operation and certification of the calibration laboratory. Provided a facility can be given the necessary environmental controls, it is possible to relocate the laboratory to another location within the commercialized Apra Harbor.

Currently, there are no privately-owned, certified calibration laboratories in Guam. Most private businesses that require instrument calibration send their equipment off-island. Because of the inconvenience, it is likely that private businesses have their instruments calibrated only if there is an obvious problem. A quick overview of potential customers (both private and GovGuam) for a calibration laboratory might include:

- Air conditioning repair businesses—calibrate pressure, temperature gages
- Guam Power Authority—calibrate pressure, temperature gages for power plant boilers, calibrate electronic equipment
- Automobile repair/body shops—calibrate mechanical equipment, electronic equipment
- Guam Waterworks Authority—calibrate pressure gages
- Airline industry—calibrate electronic, mechanical equipment
- Construction industry—calibrate electronic, mechanical equipment
- Department of Public Works—calibrate scales, mechanical, electronic equipment
- Diving Industry—calibrate pressure gages

The calibration market from the private and GovGuam sectors may be small compared to the existing DoD market, but the potential exists. Since there are no similar facilities on island, there is no competition. A privatized calibration laboratory must show that its rates would be more economical than sending the equipment off-island. The price advantage would be required to secure the workload from both the DoD and local, private entities.

3.4.5.4 Hazardous Material Handling and Storage

General. The Navy's Hazardous Materials Minimization Program (HAZMIN) is managed out of Buildings 2002 and 23 on the SRF compound. These two facilities are classified by the Navy as a "Joint Use Function," which means that the functions though needed, will be secured from a private source.

The purpose of the HAZMIN program is to store hazardous materials that are considered "excess" or with an expired shelf-life, but can still be used for their intended purpose. The program does not store "used" or "waste" materials—everything in storage is unused. The intent is to minimize the amount of hazardous materials that would otherwise go to waste. The program is similar to the DoD's Defense Reutilization Marketing Office (DRMO), and actually serves as an interim point for the materials to get used by the Navy before they are sent to the DRMO.

Building 2002 is a large, relatively new concrete warehouse, with roll-up doors, floor berms, separate acid storage room, steel racks, fire protection systems in place, and a small office facility. It is at a higher elevation than the surrounding land area, which raises it somewhat above flood elevations since the entire SRF area is within the 100-year flood zone. Most of the stored items are paint, hence its original name, "Paint Locker."

Building 23 is an older facility with a much smaller footprint than building 2002. It is also a concrete building with roll-up doors, floor berms, fire protection systems in place and a small office. It is used mainly to store those items that cannot be stored in building 2002 due to its chemistry, such as poisons.

HAZMAT Handling and Storage Market. Currently, there are no *permitted* Treatment, Storage, Disposal Facilities (TSDF) on Guam. There is a transfer facility owned by the Guam EPA on Cabras Island. It was operated under contract by Unitek, but has never been EPA-permitted as a TSDF because it is within the 100-year flood zone.

Although no figures were provided by the Navy regarding customer base for the existing buildings, it is assumed that a large share of the customer base comes from DoD entities which will not be closing, such as Navy SEALS, Andersen AFB, NCTAMS, EOD, and NAVACTS. Since the Navy intends on making this a "Joint Use Function," it can be assumed that these DoD customers will become customers of a privatized HAZMAT facility.

One local company has expressed an interest to assume the operations of the HAZMAT operations in Building 2002. It would be ideally suited for a hazardous waste management business, provided it meets EPA's criteria for a TSDF. Although Building 23 does not meet the criteria for a TSDF, it can be used in conjunction with the operator of Building 2002 if the amount of hazardous material (not waste) to be handled require the additional facility. The newly privatized operation would not only continue serving DoD customers, but would also provide a much-needed service to the island community.

3.4.5.5 Warehouse Space

General. The majority of warehouse space on Guam is centered in the vicinity of Harmon Industrial Park, near the primary business areas of Tamuning and Dededo, as well as the Guam International Air Terminal. There are also some warehouses located

on Cabras Island under the cognizance of the Port Authority of Guam. These warehouses are generally rented by the fishing industry who operate in and about the port.

Warehouse Space Market. One of the recommended reuse alternatives for Victor Wharf is to relocate the fishing industry's boats, warehousing, and business functions from the crowded wharf spaces in the Commercial Port. The industry would certainly require warehouse space (both dry and cold storage) to be in the proximity of the boats' berthing space.

A recommended reuse alternative for the Drum Lot at Polaris Point is to develop an Industrial Park, to include warehouse space. To date, the LRA has reviewed expressions of interest from businesses involved in warehousing—both dry and cold storage, furniture production, and fabrication of plastic home building products.

ASSOCIATES, INC.
Engineers/Architects

Employment Needs

4

4 Employment Needs

4.1 Summary of Market Demands

The return of facilities in Apra Harbor presents a unique opportunity for diversifying Guam's economy as well as significant challenges with respect to re-employment opportunities for former Navy employees. How successfully Guam exploits and controls the circumstances depend largely on external market conditions, future revenue streams that such markets will generate, the degree of success Guam achieves in marketing itself, and whether Guam can integrate itself as an essential member of the increasingly important Pacific Basin economy. Guam, like most Pacific Island states, is virtually exclusively dependent on external economic forces. To continue its growth, Guam must define, establish, and secure its role within the large regional economic sphere of Asia and the Pacific Basin.

Three general categories of market, and hence employment, needs can be satisfied by the conversion of Apra Harbor from a military port into a dynamic, private-operated, marine-oriented facilities:

- Ship repair/industrial manufacturing
- Fishing industry needs
- Expansion and diversification of tourism infrastructures

Additionally, the former naval facilities are suited to fulfill less demanding needs related to general warehousing, storage, industrial laboratories, and hazardous materials storage.

4.1.1 Ship Repair Industry Needs

With respect to ship repair, it is essential that Guam retains its core business of work for the U.S. federal government—specifically, the work the existing Navy SRF (Ship Repair Facility) now performs for the Military Sealift Command. That workload represents approximately 180 manyears of work, almost one-half the theoretical market demand for ship repairs in Guam. Second, an aggressive marketing plan to secure work related to the Foreign Military Sales (FMS) Program, perhaps as part of a joint-financing arrangement with a Taiwanese investor/ship repairer, needs to be pursued. That workload—which could range from 130 to 270 manyears of work—could be equal to or greater than the workload now offered by repairs to MSC vessels.

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It is evident that the fact that Guam does not now lie on a major trans-Pacific shipping route poses a significant challenge to its goal of establishing and maintaining a ship repair facility. In light of Guam's relative cost and labor disadvantages, as well as the labor force depth of competing Asian shipyards, development of an innovative production and marketing strategy, as well as government support in terms of economic incentives and adoption of a hands-off philosophy to encourage total privatization, is critical to the success of a ship repair yard in Guam.

4.1.2 Fishing Industry Needs

Historically, the appearance of a sizable commercial fishing activity in Apra Harbor is a relatively new phenomenon, having begun to attract tuna fishermen in the mid-1980s. By the late 1980s, however, Apra Harbor had become the home port to over 200 tuna vessels including both sashimi grade longliners and tuna for canning purse seiners. The presence of both longliners and purse seiners has created a demand for a range of services within Apra Harbor, including net repairs, some vessel maintenance, hydraulic repair services, warehousing, salt production, bait storage, ice production and supply, fuel, and provisioning.

Guam's ambitious Vision 2001 calls for a doubling in the number of tourist arrivals by the turn of the century. That goal provides a tremendous added benefit to the longline fishing industry as it translates directly into expanded harbor, air terminal, and most importantly, additional cargo space—air cargo space vital to assure the continued growth of the transshipment of fresh tuna to Japan. To the extent that the Western Pacific waters can sustain a higher yield of tuna (all indications are that longliners do not affect the total tuna supply), and the Japanese consumer market demand responds to the increased supply, Guam's increased harbor and airport capacities will ensure the future growth of the longliner industry.

The second half of the fishing industry, purse seiners providing tuna for canning, has received scant attention amidst the excitement over longliners and sashimi. The facts are, however, that purse seiners contribute significantly more—about 3-½ times as much—to Guam's economy than longliners. In 1995, for example, about $156,000,000 of spending was generated by the 330 purse seiners that called at Apra Harbor, compared to about $43,600,000 of spending that was generated by the 2,000 plus longliners that called during the same period. Moreover, exciting changes are occurring in the purse seine industry. In 1995, Casamar, Inc., a firm that provides repair services to purse seiner hydraulics, and American President Lines teamed to begin shipment of frozen containers of cannery-grade tuna to canneries in Bangkok. Initial response has been favorable in that container-loads are much easier to handle than vessel-loads of tuna. Moreover, the use of

containers benefits APL in that full containers are being backhauled to Asia instead of empty ones.

In another market development related to tuna canning, there is steady and growing recognition and interest among the Pacific island nations that regional cooperation is essential to assure the future health and expansion of the tuna trade. It is being argued that the Pacific nations must agree on a much more closely integrated and regulated regional cooperative arrangement in order to maximize benefits. Proponents call for a consortium of nations, similar to say, OPEC (Organization of Petroleum Exporting Countries), who would establish industry operating conditions—everything from licensing within EEZs to where purse seiners must be built and repaired. Among other areas, the consortium would also establish transshipment conditions, the location of canneries, and location of loining sites. Guam's role, given that it has no tuna within its EEZ waters, is not clear. But, while it has enjoyed current and past success as a transshipment center due to its sophisticated transportation assets, it clearly cannot sit back as its neighbors, particularly Palau and FSM, improve their infrastructures. As the largest economy in the region, it stands to reason that Guam should be one of the leaders in developing such a regional economic consortium.

4.1.3 Tourist Industry Needs

Finally, of Guam's two principal primary economic sectors—tourism and military—only tourism will expand over the next 5 to 10 years. Tourism is already larger than defense, and as tourism grows, so will the island's secondary industries. Tourism is one of the world's largest and most rapidly growing businesses, and is particularly active in the Asian half of the Pacific rim. The combined GDP of Japan, China, Taiwan, Hong Kong, Korea, Australia, and New Zealand is $6.3 trillion. This group of nations represents a vast market with a population that exceeds 1.4 billion.

Nearly 12 million Japanese travel overseas annually, and this number is likely to double in the next decade. Similar, or even larger gains in the demand for travel can be expected in the other industrial economies of Asia. With the demand for travel rising in the region, Guam offers some of the most desirable destinations in the world. To the extent that tourism is the Western Pacific's comparative advantage and high-saving and high-spending Asian tourists want to travel to places that offer the tourist services they seek, the two regions will benefit from each other's growth and prosperity.

Hence, it is not unreasonable to expect tourist arrivals to Guam to double in the next 5 to 7 years, if infrastructures can expand to absorb the new growth. Nor is it unrealistic to expect that hotel room inventory will double in the next 5 to 7 years to about 12,000

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rooms. It is clear that to satisfy tourist industry needs Guam must satisfy growing needs in retail sales outlets, expand the amount and variety of general site seeing/recreational facilities such as theme parks, water parks, and aquariums, provide facilities for increased numbers of day cruises, charter fishing, and dinner cruises, accommodate larger international cruise travel, and even consider (to some) the unthinkable—casino-style gambling.

If these changes occur as they are expected, they will more than offset the negative impact of expected cutbacks in the military payroll and generate new economic activity at a healthier level than otherwise possible in the region. Moreover, they will also generate indirect demand for some of the more remote and less commercial destinations in the rest of Micronesia. It is to Guam's benefit that the neighboring Micronesian island states develop economically into self-sufficient entities. An economically vibrant Micronesia will create more demands for goods—goods which will be serviced through the regional transshipment center at Apra Harbor.

How the primary benefits of tourism jobs, income, and taxes can be used to generate other sources of income—e.g., regional trade and distribution center, ship repair facility—to diversify Guam's economic base will be a key challenge in the near to middle term. While, the challenges Guam faces in the next 5 to 10 years are complex—it will have to maintain and upgrade its basic infrastructure, especially roads, power, and water services, add facilities to accommodate a rapidly increasing number of visitors, and expand its delivery of tourism services—the rewards are significant.

4.2 Employment

4.2.1 Guam's Historical Needs

Civilian employment data shows that peak employment occurred in 1992 when total employment reached 69,569 and has since declined each year, standing at 65,130 at the end of 1995. Table 4.1 summarizes the historical data, and Table 4.2 highlights annual changes.

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Table 4.1
Employment by Industry
Source: Guam Department of Labor

	1989	1990	1991	1992	1993	1994	1995
Private Sector							
Agriculture	227	237	290	420	382	260	290
Construction	5,832	8,604	10,471	12,467	9,980	8,760	7,680
Manufacturing	1,851	1,871	1,948	2,065	1,771	1,900	1,750
Trans & Utilities	3,166	3,520	3,700	4,346	4,231	5,200	5,090
Wholesale	1,691	1,711	1,851	2,045	2,209	2,080	2,160
Retail	9,177	9,558	10,554	12,060	12,232	12,250	12,460
Finance, Insurance, and Real Estate	2,134	2,242	2,450	2,722	2,696	2,740	2,720
Services	9,765	10,109	11,867	13,534	13,290	12,990	13,890
Total Private Sector	33,843	37,852	43,131	49,659	46,791	46,180	46,040
Public Sector:							
Federal Government	7,025	6,955	6,726	7,202	7,692	6,960	6,120
Territorial Government	10,552	11,278	11,893	12,708	13,937	13,430	12,970
Total Public Sector	17,577	18,233	18,619	19,910	21,629	20,390	19,090
Total Employment:	51,420	56,085	61,750	69,569	68,420	66,570	65,130
Percent Private Sector:	65.8%	67.5%	69.9%	71.4%	68.4%	69.4%	70.7%
Percent Public Sector:	34.2%	32.5%	30.1%	28.6%	31.6%	30.6%	29.3%

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Table 4.2
Annual Employment Changes (Percent) by Industry
Source: Guam Department of Labor

	88-89	89-90	90-91	91-92	92-93	93-94	94-95
Private Sector							
Agriculture	8.6	4.4	22.4	44.8	-9.1	-31.9	11.5
Construction	26.3	47.5	21.7	19.1	-19.9	-12.2	-12.3
Manufacturing	-2.8	1.1	4.1	6.0	-14.2	7.3	-7.9
Trans & Utilities	20.2	11.2	5.1	17.5	-2.6	22.9	-2.1
Wholesale	9.5	1.2	8.2	10.5	8.0	-5.8	-2.2
Retail	18.1	4.2	10.4	14.3	1.4	0.1	1.7
Finance, Insurance, and Real Estate	-0.8	5.1	9.3	11.1	-1.0	1.6	-0.7
Services	6.2	3.5	17.4	14.1	-1.8	-2.3	6.9
Total Private Sector	12.7	11.9	14.0	15.1	-5.8	-1.3	-0.3
Public Sector:							
Federal Government	-1.0	-1.0	-3.3	7.1	6.8	-9.5	-12.1
Territorial Government	-0.2	9.5	5.5	6.9	9.7	-3.6	-3.4
Total Public Sector	-0.1	3.7	2.1	6.9	8.6	-5.7	-6.4
Total Employment:	8.3	9.1	10.1	12.7	-1.7	-2.7	-2.2

The data confirms that Guam's boom of the 1980s that had been fueled by Japanese capital and tourist spending, resulted in peak private sector employment in 1992. Since then, private sector employment has dropped 7.3 percent. Public sector employment peaked in 1993 and has since dropped 11.4 percent—federal employment dropping by 1,572, while territorial employment dropping by 967. That trend is likely to continue as the military departments downsize their forces and the Government of Guam begins privatizing more of its functions.

The employment data shows that Guam is by far a services-oriented economy than a production-driven economy. Employment in manufacturing actually declined from 1,851 in 1989 to 1,750 in 1995, and constitutes only 2.7 percent of the total workforce of 65,130. Manufacturing, along with federal employment, are the only two employment sectors to have declined. By definition, manufacturing includes establishments engaged in the mechanical or chemical transformation of materials or substances into new products. These establishments are usually described as plants, factories, or mills and characteristically use power driven machines and materials handling equipment. Establishments

4 Employment Needs

engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement. Skilled labor, such as that currently employed at the SRF, are normally be engaged in the manufacturing industry.

Wholesale employment, in 1995 representing about 3.3 percent of the total work force, rose from 1,691 in 1989 to 2,160 in 1995, a 28 percent gain. Since peaking in 1993 at 2,209 employees, it has dropped a minimal 2.2 percent. Functionally, the work of the FISC is wholesale in nature. Wholesale establishments includes those businesses that are primarily engaged in selling merchandise to retailers; to industrial, commercial, institutional, farm, construction contractors, or professional business users; or to other wholesalers; or acting as agents or brokers in buying merchandise for or selling merchandise to such persons or companies.

Figure 4.1 graphically depicts industry growth rates between 1989 and 1995. The rate of growth in the manufacturing sector was the lowest of all the private industry sectors while tourist-oriented industries such as transportation, services, and retail sales performed relatively well. Manufacturing, as well as federal employment declined during the period.

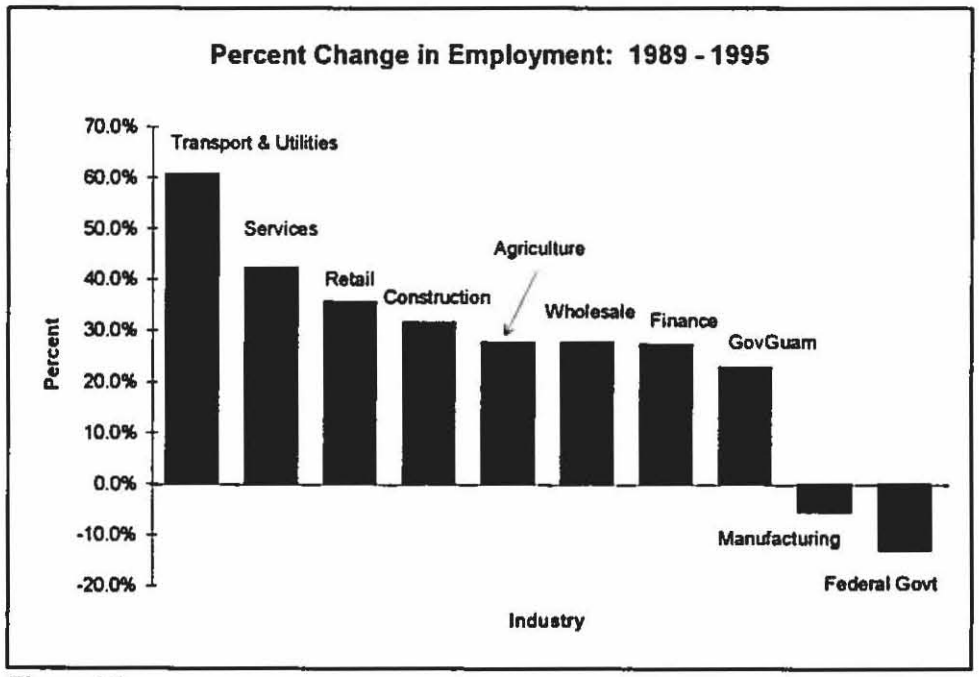


Figure 4.1

4 Employment Needs

4.2.2 Expected Reductions in the SRF Workforce

The latest available information from the U.S. Navy indicates that the SRF's current civilian workforce numbers approximately 440. According to the Navy plan, the workforce is scheduled to decline to 300 by the end of the second quarter of fiscal year 1997 (March 1997, the official mission cease date), and to 200 by the end of the third quarter of fiscal year 1997 (June 1997). The Navy intends to drawdown its personnel through a combination of personnel actions including separation incentives, early retirement options, outplacement programs, priority placements, and reductions-in-force (RIF). Upon closure in September 1997, 51 of the 200 employees are scheduled for transfer to NAVACTS, while 149 will be released from federal service.[1] Hence, approximately 389 of the estimated 440 current employees at the SRF will be released by the Navy in the next 12 months. Not all of these 389 civilian personnel will require local re-employment, however, as undoubtedly some will elect early retirement[2] while others will relocate out of Guam, to retire, to continue their federal employment elsewhere, or to pursue a new civilian career outside the territory.

The 389 workers possess a variety of skills, those constituting the largest numbers being:

Electrician	28
Machinist	26
Welder	26
Marine machinery mechanic	22
Pipefitter	22
Shipfitter	16
Production machinery mechanic	13
Painter	12
Sheetmetal mechanic	12
Rigger	11
Insulator	10
A/C Equipment mechanic	7
Boilermaker	7
Electronics mechanic	7

[1] There remains some uncertainty with the number 51. The Navy originally stated that it would retain 114 of its SRF personnel for operating its drydock. Since then, however, the Navy has decided to release its two drydocks—it now intends to release one of its drydocks to GovGuam and transfer its second drydock facility to its lease program. Notwithstanding the Navy's current intent, the number 51 does not appear to be a final definitive figure.

[2] It was reported at the September 10, 1996 meeting of the Executive Staff Oversight Committee that 192 current employees at the SRF and FISC have registered for the early retirement program.

4 Employment Needs

Successful privatization of the SRF and retention of a core repair workload for work on MSC ships will re-employ approximately 180 of the 326 displaced workers, leaving 146. These remaining workers will all be re-employed if Guam is successful in retaining not only the MSC work, but also the promising FMS workload. The latter is expected to require between 130 and 270 manyears of work, effectively eliminating worker displacement. Timing, however, remains a challenge, as it is questionable whether all 326 workers to be released by the Navy can be immediately, without interruption, be reemployed by a private SRF operator upon closure of the SRF in September 1997.

As the historical employment figures confirm, Guam has not been a production-oriented economy, and other than the continuation of ship repairs as described in this plan, there is little optimism for a new manufacturing industry. That presents a dilemma for the approximate 146 workers should the FMS workload not materialize, or if it doesn't materialize immediately and concurrently with closure. A possible alternative is with Guam's electrical power industry.

Although a discussion of Guam's power problems and challenges is beyond the scope of this plan, it is a fact that Guam continues to suffer from a severe power shortage. Peak electrical demand regularly exceeds peak production capabilities. During periods of high demand, rolling power outages are the norm. To address the shortage, the Guam Power Authority (GPA) is reportedly to enter into a series of partnerships with private companies to provide an additional 100 megawatts of generation capacity by December 1998. GPA intends to direct the private partners to hire the required additional workers from the local work force. Clearly, the 33 percent increase in power generation and the associated operation, maintenance, and service needs will demand the skills of those being released from the SRF. While some skills may not be an exact match for the power companies, the workers are likely to be easily re-trained, having worked in a somewhat similar and compatible industry. As an financial incentive, companies who hire about-to-be-released SRF employees may be eligible payments up to $10,000 per employee for retraining.

4 Employment Needs

4.2.3 Expected Reductions in FISC Workforce

Information provided by the Navy shows that the current civilian workforce at its Fleet Industrial Supply Center numbers approximately 350 full time personnel. In the language of BRAC, the FISC is being disestablished—not closed—meaning that its present command structure (organization) will be eliminated, but its functions will continue to be performed under a different functional arrangement.

At present, the Navy is considering two options for the disestablishment: (1) Converting the FISC into a "department" under NAVACTS, and (2) Converting the FISC into a "detachment" under the FISC at Pearl Harbor, Hawaii.[3] Under either alternative, the Navy proposes to systematically convert the FISC into a government-owned, contractor operated function, ultimately through an all-encompassing Base Operations Contract (BOS). Current Navy plans call for conversion in four phases as follows:

- Phase I, the current phase, provides for a full-service FISC. Some selected functions have been contracted, e.g., Preventive Maintenance for Material Handling Equipment and Maintenance of the FISC Refrigeration Plants.

- Phase II is to take effect on October 1, 1997, when FISC, Guam, converts to a department/detachment under either NAVACTS or FISC, Pearl Harbor. The detachment is expected to employ from 147 to 205 civilians, which means that about 150 civil service employees will be released. Additional FISC functions are expected to be commercialized through small, individual contracts, while other functions may be transferred to NAVACTS.

- Phase III would continue the commercialization and personnel reduction process. These changes have been outlined only conceptually, and no dates or numbers are available.

- In Phase IV, all supply functions on the island will be consolidated and managed by a single island-wide logistics support *Base Operating Support* (BOS) contract. The intent is to consolidate the regional supply needs under the control and management of a single private contractor.

[3] At the September 10, 1996 Executive Staff Oversight Committee meeting, it was reported that the Navy has made the decision to reorganize the FISC as part of NAVACTS. No other definitive information was available at the time this plan was written.

4 Employment Needs

As in the SRF, the civil servants at the FISC possess a variety of skills, but primarily in the supply and administrative functions. A review of the personnel data shows that among the skills represented are:

Materials handlers	25
Supply technicians	36
Security guards	13
Accounting technicians, budget analysts, program analysts	12
Computer clerk/specialists	6

These are skills which are readily adaptable to private industry, having little real difference between military work and civilian work. The employees are particularly suited for re-employment in the booming retail sector of Guam's economy, as well as in the wholesale and services sectors. As Table 3.27 and 3.28 showed, Guam's retail sector is the only employment sector that has consistently expanded, even during the economic downturn following 1992. Because Guam's economy is expected to be fueled principally by tourism and its supporting industries, retail sales, wholesale, and other services can be expected to grow at a healthy pace. Current discussions and negotiations for expansion of Guam's retail sales industry through the construction of a major "factory outlet" mall and new specialty restaurants such as the *Hard Rock Cafe* and *Planet Hollywood* are sure to generate increased employment opportunities that could readily absorb excess FISC workers.

GMP
ASSOCIATES, INC.
Engineers/Architects

Planning Considerations

5

5 Planning Considerations

Effective planning requires a clear understanding of long-range objectives and a vision of long-term requirements. Short-range, and intermediate range uses should be evaluated in terms of their compatibility with these long-range objectives. This section presents the overall strategic plan for the reuse of Apra Harbor; outlines statutory and regulatory considerations for planning, operating, and maintaining the harbor and its facilities; outlines considerations with respect to shipping channel configurations; and discusses functional facility planning modules.

5.1 Overall Concept for the Reuse of Apra Harbor

Criteria for siting facilities for permanent, long-term uses include the following criteria:

- Depth of water for access and berthing
- Adjacency issues, both positive and negative, for functional relationships and expansion flexibility between terminals
- Land access issues
- Utilization of existing assets and current land uses
- Aesthetic and environmental considerations

Conceptually, long-term uses for Apra Harbor should be evaluated based on its two distinct regions: Inner Apra Harbor and Outer Apra Harbor. Figure 5.1 depicts the existing facilities in both Inner and Outer Apra Harbor areas.

After reviewing Guam's reuse desires, areas which the Navy is considering releasing to GovGuam, and current operations and land usage within the commercial port by the Port Authority of Guam, the following functional reuse possibilities were evaluated:

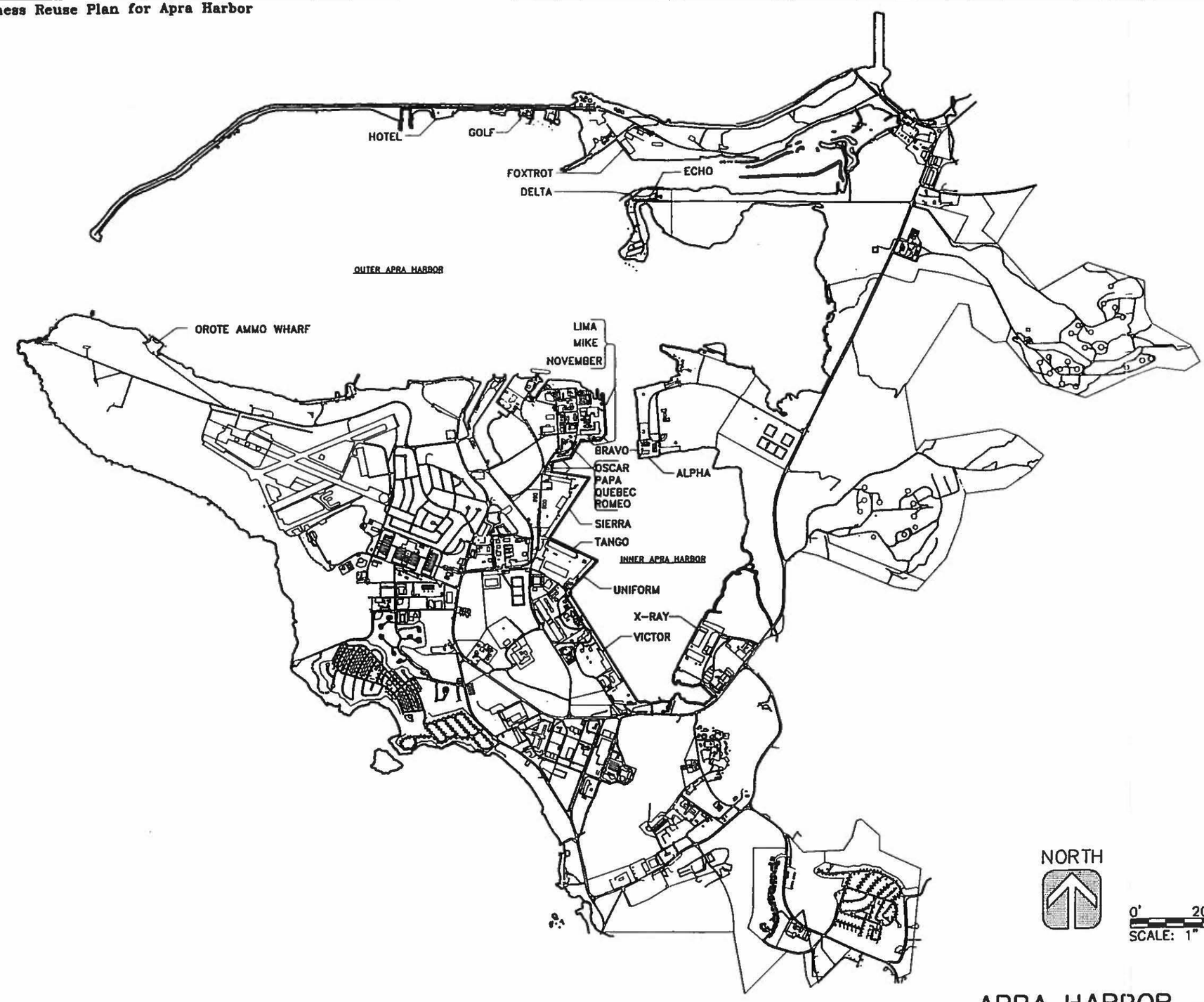
- Passenger/Cruise Facilities
- Local Excursion Facilities
- Fisheries Facilities

5 Planning Considerations

- Ship Repair Facilities
- Containerized Cargo / Transshipment Terminals
- Break-Bulk/Autos Terminals
- Liquid Bulk Terminals
- Dry Bulk Terminals
- Warehousing
- Light Industry
- Tourism Development
- Public Use
- Conservation
- U.S. Navy
- U.S. Coast Guard
- Lay Berths

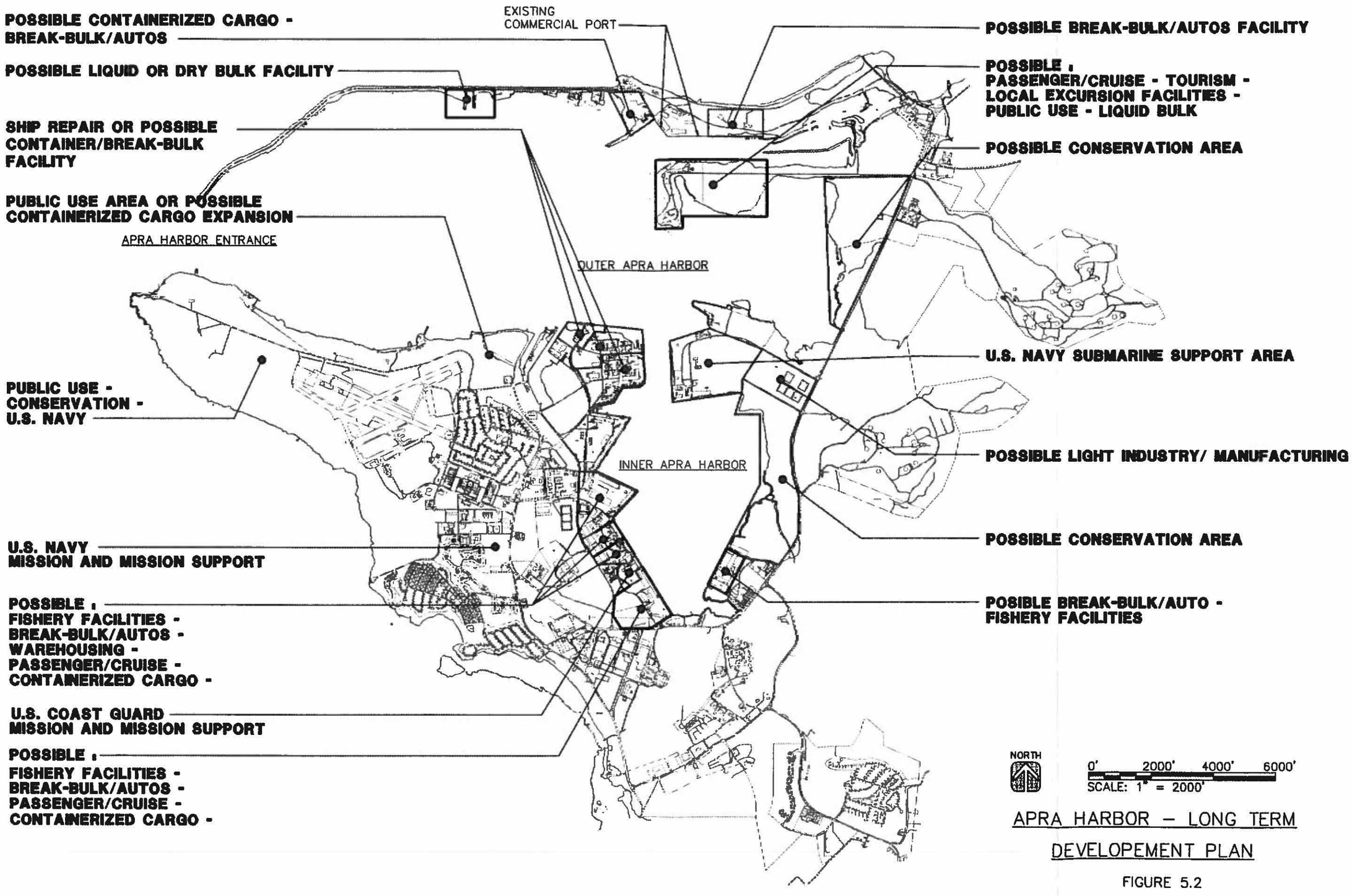
These uses were evaluated against the listed criteria and potential use areas were identified as shown in the Long Term Development for Apra Harbor, Figure 5.2. These approximate areas are shown conceptually to depict functional locations with the best potential to accommodate new facilities and/or reuse of existing ones, while maintaining an efficient port system. They are not intended to define specific boundaries nor exact acreages. While, numerous permutations of alternative locations and uses are possible, for this analysis functional relationship and adjacency considerations were the primary factors that were used to identify the most realistic and practical locations for the functions shown.

In addition, other potential uses, though not specifically located within Inner or Outer Apra Harbor, could be added to the long-range plan as needs arise. These other uses could include:



APRA HARBOR – EXISTING SITE PLAN

Figure 5.1



APRA HARBOR – LONG TERM DEVELOPEMENT PLAN

FIGURE 5.2

5 Planning Considerations

- Fueling Services
- Miscellaneous commercial, industrial, and institutional uses
- Ancillary Support such as:
  - Police
  - Fire Protection
  - Tug Boat Services
  - Oil Spill Control

Because Apra Harbor has to physically distinct areas—Inner and Outer Harbors, there are two different approaches to reuse. The proposed alternative uses and reuses focus on specific areas in order to represent the potential opportunities that may be available for each area. The following sections provide a brief discussion of the long-term uses for the two harbor regions.

5.1.1 Inner Apra Harbor.

The Inner Apra Harbor area, with its shallow entrance channel—some portions of the entrance channel are between 33 and 45 feet MLLW—is currently limited to smaller class vessels that can successfully negotiate these shallow waters. Unless a costly and aggressive dredging program were to be initiated, the Inner Apra Harbor area will be limited to smaller ships such as cruise, cargo, or fishing vessels that are presently deployed in the region. Cargo such as liquid bulk with its deep draft vessels are not primary candidates for Inner Harbor locations. These limitations, however, in no way diminish the vessel call values that the Inner Apra Harbor is capable of accommodating. In general terms, the Inner Harbor is suitable for the following functions:

5.1.1.1 Eastern side of the Inner Harbor

- *Light Industrial Manufacturing*—Although the Navy will maintain control of Polaris Point on the eastern side of the Inner Harbor, the former Drum Lot area is available for conversion to a private industrial or manufacturing facility(s) for the fabrication of consumable goods or construction products.

- *Conservation Area*—Some areas have been defined within the Inner Apra Harbor which should remain in their natural state, or in some cases, be suitable as environmental mitigation banks that can be used to mitigate the use of other sensitive areas that are more suited for development. These areas could include existing wetlands areas. The area south of Polaris Point is a vast coral development and should not be disturbed.

5.1.1.2 Southwestern Inner Harbor. Victor Wharf is considered one of the prime properties in the Inner Harbor and offers a wide variety of opportunities for port uses. Additionally, the availability of Uniform Wharf and limited amounts of backlands in the general vicinity makes the area attractive from a redevelopment perspective. The main opportunities could be:

- *Fishery Facility*—This area could take advantage of the existing open space and storage buildings at the wharf. The western Pacific has gained recognition as one of the finest fishing regions in the Pacific. While the appearance of a sizable commercial fishing fleet in Apra Harbor is a relatively recent phenomenon, the potential for the expansion of existing facilities remains a likely option. In order to accommodate all of the local and foreign fleet, some expansion of the existing facilities may be necessary. However, it should be noted that a number of variables can ultimately affect the required need for additional fishing facilities such as the relative unpredictability of fish populations, instability of demand for fresh fish, and fluctuation in the Japanese currency.

- *Break-Bulk*—Break-Bulk cargo operations in the Inner Apra Harbor is a viable possibility if smaller vessels that are capable of negotiating the shallower water are utilized—a typical usage pattern for this type of cargo. Some of this break-bulk cargo is often in the form of construction materials, newsprint paper rolls, steel products, or even automobiles. Although most of the break-bulk cargo that is currently destined for Guam arrives at the Commercial Port, there may not be sufficient space available at the Commercial Port to justify the dedication of land for break-bulk cargo. And given the market analysis that suggests that some increase in the demand for break-bulk cargo is anticipated for Guam, new facilities may be required. Because Break-Bulk facilities require large transit sheds, the northern part of the wharf may be best suited for this use. Two large warehouses currently exist at the north end of Victor Wharf.

- *Warehousing*—Like Break-Bulk, large warehouses are required for efficient operations. Moreover, multiple warehousing is highly desirable. In order to

minimize capitalization costs, the most prudent approach might be to wait until such time that the Navy identifies excess warehousing requirements (and their release) before initiating a public or private investment program.

- *Passenger/Cruise Facilities*—Many of the smaller class cruise vessels can use the facilities at the existing wharves of the Inner Apra Harbor. Guam has become a popular destination for large groups of Japanese tourists and the potential exists for a sizable increase in the number of tourists from East Asia, Europe, and the U.S. However, an expansion of many of the existing tourism facilities would be required. The potential for an increase in private sector jobs is just one of the possible benefits associated with this proposed expansion, given the need for new tourist facilities and services. The passenger cruise facility could be located on or near Victor Wharf. Additionally, Uniform Wharf includes a relatively open area, with sufficient room for the construction of a reasonable passenger terminal.

- *Local Excursion Facilities*—The potential for local excursion cruises, including dinner and dance cruises, and local daylight cruises—including fishing charters—represents another feasible market for significant new economic development within the Inner Apra Harbor. Portions of Victor Wharf or Uniform Wharf could be used to dock these relatively small vessels.

- *Containerized Cargo Terminals*—Some potential exists for the future expansion of the existing container terminal facilities. While the short-term need for additional containerized cargo appear to be minimal, long-term needs could prove quite different. Given the availability of existing wharf structures, and the potential for available backland areas for storage, several of the wharves along the Inner Apra harbor could be ideal suited for a long-term development scenario. However, since the Coast Guard will remain at its present site, this could be an impediment to the development of adjacent container facilities. In addition, some dredging would be required to allow the larger container vessels access to the facilities. While the cost is likely to be high, it may be more cost effective than filling the very deep waters in areas designated in the Outer Apra Harbor for containerized cargo terminal development.

- *U.S. Navy*—Some U.S. Navy areas should continue to remain under the jurisdiction and use of the Navy. These areas include some of the existing housing and other related infrastructures that could be required by the Navy in order to maintain and operate their facilities.

- *U.S. Coast Guard*—The existing U.S. Coast Guard area will remain under the jurisdiction of the Coast Guard. This area include an approximate 400-500 foot section of Victor Wharf, some existing housing, and other related infrastructure that would be required by the Coast Guard in order to maintain and operate their facilities.

5.1.2 Outer Apra Harbor

Outer Apra Harbor, with its deep entrance channel, represents a much greater potential for deep water berths—the average water depth in the Outer Apra Harbor and Middle Ground is over 100 feet. Some of the berths located within the Commercial Port, which are located along the northern shoreline of Outer Apra Harbor have fairly shallow water or underwater obstructions (coral heads at -22 feet below MLLW are present at Berth Foxtrot-6) and several of the wharf structures experienced extensive damage during the August 1993 earthquake. Despite some of the apparent draft restrictions at several of the wharves in Outer Apra Harbor, however, the opportunity to develop several deep water berths exists. The potential for deep water berths presents an opportunity for many more of the larger class cargo vessels to call on Guam. In addition, within the deep water areas of Outer Apra Harbor, there are four anchorages for commercial vessels and three that are reserved for the U.S. Navy. Except for U.S. Navy imposed restrictions to portions of the Harbor due to submarine activities and special explosive anchorage zones, the Outer Apra Harbor area is generally accessible to large cargo vessels. A description of the potential long-term uses for Outer Apra Harbor is as follows:

- *Liquid Bulk Terminals*—Liquid Bulk Terminals generally require deep water berths. For this reason, any new liquid-bulk terminal development should be situated within the Outer Apra Harbor region. Liquid-bulk terminals can often be designed to have mooring dolphins located in the deep water portions of the Harbor with pipelines which transfer the products to remote storage tanks that could be located several miles away.

- *Dry Bulk Terminals*—Dry Bulk Terminals also generally require deep water berths. Therefore, they have been designated for possible development within Outer Apra Harbor. However, unlike Liquid Bulk Terminals, Dry Bulk Terminals usually require large open areas for the storage of products like coal, petroleum coke, and aggregates, or large silos that can accommodate products like cement, grains, and other dry products or materials that cannot be exposed to the elements. These areas are preferred to be immediately adjacent to the wharf.

5 Planning Considerations

- *Containerized Cargo Terminals*—Some potential exists for the expansion of the existing container terminal facilities. Given a likely rise in Guam's population, as well as the impacts and affects of tourism on the local economy, increases in demand for consumer goods can be anticipated. The population increase, as well as the growth in the Asia/Pacific market, presents a possible scenario for expansion of the existing cargo handling facilities. These adjustments could come about in the form of expansion to the existing container facilities as well as technological improvements to the handling equipment and operating efficiencies of the terminal. While some expansion to the existing facilities can be anticipated, it should be noted that the location(s) of this expansion should be carefully evaluated as fill in some areas of Outer Apra Harbor for new construction would be impractical due to the deep water characteristics. One location is the west side of the existing commercial port due to its existing wharf and deep water.

- *Break-Bulk/Autos Facilities*—Break-Bulk and Automobile terminals could be located on the east side of the container terminal since the water i shallower than the rest of the harbor, and these types of vessels generally require shallower drafts. Due in part to the recovery of the construction industry in Guam, an increase in the demand for break-bulk facilities is anticipated. Most of the construction materials that arrive in Guam are destined for the existing break-bulk terminal at the Commercial Port. However, some construction materials also arrive in Guam in containers. Given the projected increase in cargo tonnage, the existing facilities that currently handle container and break-bulk cargoes may be inadequate to handle a substantial increase.

- *Transshipment Container Facilities*—Some potential exists for the development of a dedicated transshipment container terminal facility. Given Outer Apra Harbor's excellent navigational approaches, its deep water characteristics, and the potential for available land for development, consideration should be given for a dedicated transshipment terminal. This consideration could be in the form of identifying potential sites which are adjacent to deep water and could provide approximately 50-75 acres of developable backland for storage areas. However, it must be noted that because of certain geographic factors, such as voyage distances, sailing times, as well as the considerable economic investment required for this type of venture, a transshipment facility may not prove to be a feasible option. Further evaluation is necessary, especially if Guam were to launch an aggressive marketing effort that could attract potential transshipment carriers.

- *Local Excursion Facilities*—The potential for local excursion cruises, including dinner and dance cruises, and local day time cruises represents another feasible market for significant new development within Outer Apra Harbor. This type of

service, utilizing some larger vessels with capacities of up to 150 passengers, as well as some smaller vessels with capacities of around 50 passengers, is already a very popular and growing service near the Commercial Port with visitors to Guam. Given the robust presence at the Commercial Port, this type of service could be expanded proportionally to the growing rate of tourism in Guam.

- *Public Use*—Public use areas are often open space areas like parks, small vessel marinas (yachts), or public piers for fishing. These areas can provide recreational and aesthetic benefits to overall land use plans. Also, they are intended to provide public access to areas that are sometimes adjacent to working environments like fishing fleets or other industrial facilities that can offer the public insights and access to the everyday activities of a working port and other maritime activities. These activities and their benefits to the community are often misunderstood by the public or are sometimes perceived to be shrouded in mystery. Thus, public access uses are valuable for both the local and tourist populations.

- *Conservation*—Some areas have been defined within the Inner Apra Harbor which should remain in their natural state, or in some cases, be suitable as environmental mitigation banks that can be used to mitigate the use of other sensitive areas that are more suited for development. These areas could include existing wetlands areas.

5.1.3 Ship Repair Facility Area

Perhaps the Ship Repair Facility and its surrounding area have the greatest reuse potential of all the BRAC properties. There are three likely uses for this area that is strategically located at the junction of the Inner and Outer Harbors. The SRF covers over 150 acres and benefits both from deep water on the north (Outer Harbor) side and the operating cranes on the east and south sides.

- *Ship Repair Facilities*—Given Guam's competent work force and adequate existing ship repair facilities, the potential for an expansion of, or addition to, the existing facilities within Outer Apra Harbor remains a potentially viable option. This is true, despite the intense competition from nearby Asian ports which compete with Guam for this type of activity.

- *Containerized Cargo*—Container cargo operations are a likely possibility at the northern side of the SRF area. However, this scenario may require some additional dredging in several areas. Some coral could be affected, and the environmental impacts will require additional study.

- *Break-Bulk*—For the same reasons discussed above for containerized cargo, Break Bulk operations can also be supported at the SRF. This use would be less costly than a container terminal and would still allow a ship repair facility to operate independently.

5.2 Legal and Regulatory Planning Considerations

A wide variety of potential legal issues will affect the future success of the Port of Guam redevelopment effort. This section takes a broad approach to some of the legal and regulatory concerns that are the most significant and relevant to this reuse plan. In particular, the following four categories of issues will be discussed:

- Shipping and Maritime Issues
- Guam-Specific and Potential Port Development Issues
- Environmental Issues; and
- Miscellaneous Proposed Defense Legislation

This section focuses on current legislative proposals which may be less well-known, but which could have an important effect on the success of the redevelopment effort.

5.2.1 Shipping and Maritime Issues

5.2.1.1 The Merchant Marine Act of 1920 (The "Jones Act"), [46 U.S.C. App. §§ 883-889]. Perhaps the most dominant legal issue affecting Guam's ability to attract and retain a robust shipping industry is the Jones Act. The Jones Act requires that cargo shipped between certain defined United States territories be transported on ships that are U.S.-built, U.S.-flagged, U.S.-manned, and U.S.-citizen owned, specifically documented and authorized by the Coast Guard for such shipments. The Act is also applicable to vessels engaged in the fishery trade as well as their owners and crew. The ostensible purpose of the Jones Act is to maintain a United States shipping capability for times of national security emergencies.

The costs of the Jones Act can be considerable. United States shipping is much more expensive than shipping through foreign carriers for a number of reasons. Accordingly, without the requirements of the Jones Act, many United States jobs in the shipbuilding

and shipping industries would likely be lost to foreign competitors absent these restrictions.

American Samoa and the Virgin Islands now have exemptions to the Jones Act, and the other non-contiguous states and territories (Hawaii, Alaska, Puerto Rico, and Guam) want similar status. Supporters of the Jones Act do not want any modification to its provisions, both to protect lucrative shipping business to distant ports and to prevent any openings for broader repeal or modification of the law. Without an exemption from the Jones Act, Guam's ability to serve as a major transshipment port to the United States would appear to be seriously limited.

Although recurring efforts to reform the Jones Act have been made without significant progress, Congress is again considering a bill which would revisit the Jones Act with the goal of limiting the scope of its coverage. On May 23, 1996, *The Coastal Shipping Competition Act of 1996*, S. 1813, was introduced by Senators Jesse Helm (R-NC) and Charles Grasley (R-IA). A day of hearings was held on June 12th. No companion bill exists in the House, and the Clinton Administration has voiced support for the broad provisions of the Jones Act. Although final action on the proposal this year is unlikely, the issue is receiving serious consideration that may provide a foundation for a serious legislative push in future sessions of Congress.

5.2.1.2 Rates and Charges Shipping Statutes: (1) The Shipping Act of 1916 [46 U.S.C. App. § 801 et seq.], (2) The Intercoastal Shipping Act of 1933 [46 U.S.C. App. §§ 843-848], and (3) The Shipping Act of 1984 [46 U.S.C. App. § 1701 et seq.]. These laws govern shipping between Guam and the United States (The Shipping Act of 1916 and the Intercoastal Shipping Act of 1933) and between Guam and foreign ports (The Shipping Act of 1984). Both acts are similar in their regulatory scheme. The Federal Maritime Commission ("FMC") is given authority to regulate rates and charges for the shipping of ocean cargo.

The impact of the FMC's action can have powerful and far-reaching effects on the economy of an island territory such as Guam. Shipping rates which are set too high can increase the costs of goods to Guam and lessen the competitiveness of local value-added industries dependent upon the import of raw materials. Both effects can lessen shipping volume and diminish port traffic. On the other hand, rates must provide incentives for shipping goods to Guam, although this concern is much less likely to pose a problem.

The importance of reasonable shipping rates is underscored by a major proceeding the Government of Guam brought before the FMC against two major shipping lines. After seven years of litigation, an administration law judge found that the Government of Guam

did not prove its claims that the rates charged were unjust or unreasonable. *The Government of the Territory of Guam, et al. v. Sea-Land Service, Inc. and American President Lines, Ltd.*, Docket No. 89-26 (June 3, 1996). Apparently, the Government of Guam intends to appeal this decision.

On May 1, 1996, the House passed H.R. 2149, *The Ocean Shipping Reform Act*. This legislation, strongly supported by ocean carriers, would effectively eliminate regulatory control of shipping rates and charges. The bill would retain the antitrust immunity of shippers and carriers, eliminate contract filing and enforcement, authorize shippers and carriers to enter into private contractual arrangements of ocean shipping, and terminate the Federal Maritime Commission at the end of the next fiscal year. Before the final vote was taken, the House defeated an amendment which would have required public disclosure of the essential terms, conditions, and rates of ocean service contracts and transferred FMC's responsibilities to the Surface Transportation Board. The Senate is less likely to support such a sweeping measure, although action this legislative session is possible.

5.2.1.3 International Convention for Safety of Life at Sea 1974 (SOLAS).

The United States is a signatory nation to the international SOLAS convention which primarily deals with the safety of passengers and crew members on international voyages. SOLAS contains a provision called the International Maritime Dangerous Goods Code (IMDG) governing the transport of dangerous cargoes. This code is recognized as the standard for the safe transport of packaged dangerous goods by sea and, because ports are closely linked it is also taken as the standard regarding port operations. The status of IMDG is advisory, requiring individual nations to undertake implementation. It deal with:

- Classification
- Documentation
- Stowage
- Segregation
- Packaging and packing
- Marking, labeling and placarding

5 Planning Considerations

5.2.2 Guam-Specific and Potential Port Development Issues

The potential for development of Guam's port could be significantly enhanced by a wide variety of port development possibilities. Most of the issues below are pending legislation; however, all deserve attention due to potential impact on port reuse and redevelopment.

5.2.2.1 Foreign Military Sales of Excess Navy Ships, [P.L. 104-106, National Defense Authorization Act for Fiscal Year 1996]. When legislative authorizations permit the U.S Navy to sell excess ships, these authorizations have consistently required that modifications to these ships prior to transfer must be made in U.S. shipyards (public or private). In a provision of the FY96 Defense Authorization legislation, Guam was declared a "U.S. shipyard location." The purchasing country pays for the initial overhaul in addition to the cost of the ship. Because the purchasing country pays for these repairs, it can specify which U.S. shipyard shall perform the work, although purchasing countries rarely express a preference. These overhauls are significant repair efforts that would greatly enhance the Ship Repair Facility's prospects for successful commercialization.

5.2.2.2 Proposed Amendment to Magnuson Act re Commercial Fishing, [S. 39, which would amend 16 U.S.C. §§ 1801 et seq.]. The Senate has approved an amendment to the Magnuson Act which allows creation of Pacific Insular Area Fishery Agreements (PIAFAs). The provision allows the Governor of Guam, working with the State Department, to negotiate agreements with other nations to fish in Guam's Exclusive Economic Zone (EEZ). The payments made for these rights would go to Guam to be used for fishery-related activities such as the development of new port facilities to support the increased fishing activities. This has the potential to significantly increase fishing in the waters around Guam. It may also allow the Governor to influence or require foreign fishing fleets to use Guam facilities, although proximity to the fishing locations would already advantage Guam over other locations.

There may be some risk to the local fishery of Guam stemming from the following factors if this PIAFA is implemented:

- Foreign fishing vessels often use techniques which re destructive to the fishery as a whole. These techniques, although illegal, are difficult to police and enforce.
- Money received for fishing rights granted by the Government of Guam would most likely be deposited into its general fund. It is difficult to guarantee that an equal amount would be spent on fisheries enhancement.

- Foreign vessels calling in Guam could "dump" products on the local market and depress the local fishing industry.

- Alternatively, foreign vessels which do not call in Guam will divert the resource away from the local markets with a secondary impact on the restaurant and hotel business.

5.2.2.3 Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, [P.L. 102-240]. This legislation provides funding for transportation projects that assist the development of a national intermodal transportation system. It is in the process of being reauthorized in FY97. Once reauthorized, the Act has the potential for funding projects related to port development. Infrastructure improvements that enhance use of Guam port facilities may be eligible for future ISTEA funding.

The types of projects most likely to qualify for ISTEA are those which improve inland transfer of cargo. In particular, these project should have a potential to reduce air emissions or fuel consumption. Such projects include highway intersection upgrades, cargo corridors, and grade separated crossings. Direct funding of port projects such as wharf improvements or equipment purchases is unlikely.

5.2.2.4 Removal of Restrictions on Contiguous Port Property, [H.R. 3230]. In 1980, the Congress passed Public Law 96-418, which allowed the Government of Guam to receive 927 acres of land contiguous to the commercial port and dry dock island. This property was intended for commercial port development; however, section 818(b)(2) of that law requires the Government of Guam to receive monetary value equal to or in excess of fair market value (in GSA's judgment) for any lease or sale of that property. Further, any payments in excess of Guam's development expenses must be returned to the U.S. Treasury. The effect of this legislative provision has been to impede Guam's ability to attract industrial and port-related development. As a result, most of this property remains undeveloped because of these restrictions.

The National Defense Authorization Act for FY97 is now in conference. Due to the efforts of Guam's representative in Congress, Robert Underwood, the House version of this legislation contains a provision that would lift these restrictions placed on the property. Passage of this legislation could enhance this ability of Guam to encourage port development.

5.2.2.5 Guam Land Return Act, [H.R. 3501]. Legislation has been proposed that would give Guam first rights to any excess federal lands on Guam. Guam would have preference for the property over other federal agencies. The property would also be conveyed at no cost to the Government of Guam. Passage of this proposal could facilitate transfer and use of property which would aid Guam's port facilities and related economic development. The Department of the Interior (Fish and Wildlife) is on record as opposing this legislation.

5.2.3 Environmental Issues

5.2.3.1 The Federal Water Pollution Control Act (the "Clean Water Act"), [33 U.S.C. § 1251 et seq.]. Section 404 of the Act (33 U.S.C. § 1344) provides a regulatory and permit regime for the discharge into navigable waters of dredged or fill material. The definition of navigable waters also includes "wetlands." Under this regime, the Corps of Engineers is responsible for issuing permits for discharges of fill materials; however, the Environmental Protection Agency is the ultimate decision maker for Section 404 permit determinations with veto power over Corps. The definition of wetlands, and the EPA's scope of authority in these matters, are both very broad.

Certain property in and around the Port of Guam almost certainly comes under Section 404 protection, in particular the lands in and around drydock point. Before any permits are issued that would make the property more useful to industrial and port-related development, the Corps would engage in an extensive public interest review. *See* 33 C.F.R. 320.4. Basically, the Corps is required to: (1) issue permits only for the least environmentally damaging practicable alternative; (2) make sure that appropriate and practicable steps to minimize adverse impacts are included through project modifications and permit conditions; and, (3) engage in compensatory mitigation steps for any unavoidable adverse impacts by restoring, repairing, or replacing the functional values lost. Guam will need to weigh desired economic development goals against strictures resulting from Clean Water Act requirements.

The Clean Water Act is also applicable to discharge of fish offal from commercial fish processing plants. This practice is universally prohibited by the Clean Water Act as there are several less damaging alternatives possible. The best alternative is often commercial use of the offal either by converting it to marketable fish meal or by sending it to a rendering plant. If these alternatives are not available in Guam, then upland disposal must be used for this material.

The Coast Guard administered Marine Environmental Response Program is authorized under the Clean Water Act and was originally devised following the "Torrey Canyon"

tanker accident. Following the "Exxon Valdez" spill, this program was strengthened to provide Regional Response Teams (RRT) for each area which may be impacted by a major oil spill. Planning in Apra Harbor should incorporate a designated RRT deployment area.

5.2.3.2 The Clean Air Act of 1970, [PL 91-604]. The Clean Air Act establishes emission standards for motor vehicles and aircraft as well as national ambient air quality standards. Although vehicle standards cannot be applied to vessels in international trade, the Clean Air Act can be applied to a ports ambient air quality.

Most active ports are located in industrial urban areas with a high background of air emissions due to fossil fuel consumption. When such an area exceeds the established maximum level of pollutant loading for a certain period of time it is designated as a "non-attainment" area. Such non-attainment areas are required to pursue active policies of emission reductions until the non-attainment status can be removed.

Commercial seaport activities can contribute to the total emission loading of the area through three basic mechanisms:

- Vessel stack emissions, both while maneuvering in harbor and while maintaining power in port.
- Diesel exhaust emissions from container and cargo handling equipment.
- Exhaust emissions from trucks engaged in cargo distribution and inland transport.

Even if the port is not in a non-attainment area, total projected air emissions are considered as a negative impact in the Federal Environmental Impact Study.

5.2.3.3 The National Environmental Policy Act ("NEPA"), [42 U.S.C. §§ 4321-4370a]. NEPA is the major federal statute governing the procedures required for analyzing environmental impacts from proposed development activities. For any proposed federal action, absent some categorical exclusion from the statute, one of two outcomes will occur: either a finding of no significant impact ("FONSI"), or a finding that the proposed action will constitute a major federal action significantly affecting the quality of the human environment. The latter finding triggers the "environmental impact statement" ("EIS") process.

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Reuse activities of the size and scope of those contemplated in connection with the Port of Guam redevelopment are almost certain to trigger the EIS process. The Navy will perform the EIS prior to permanent transfer of any property based upon the reuse plan submitted by the local redevelopment authority. The time needed for this process must be factored into any feasible business plan for port facilities and related development.

The EIS process proceeds in two phases; the first phase results in a draft statement which is circulated for public review and comment and the second phase results in a final statement which incorporates changes suggested by the regulatory agencies during the draft review stage. Completion of this process occurs when the EPA officially accepts the final EIS. No construction is allowed until acceptance of a final EIS document. Regulatory comment generally involves avoidance or reduction of identified impacts as well a acceptance of suggested mitigation measures for unavoidable impacts. The EIS is subject to court challenge if it can be shown that due diligence was not used in its preparation or that falsified information was submitted in the initial impact identification.

5.2.3.4 The Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA," also know as the "Superfund" law), [42 U.S.C. 9601 et seq.]. CERCLA imposes cleanup liabilities on any party which acts as the owner, operator, generator, or transporter of hazardous wastes. CERCLA imposes joint and several liability; as a result, a party who acquires contaminated property could faces liability for the entire cleanup costs if no other potentially responsible parties are located. CERCLA also provides funding for the cleanup of certain major contaminated waste sites.

One point worthy of note is that CERCLA contains a waiver of sovereign immunity provision. Every department, agency, and instrumentality of the United States is subject to CERCLA liability just as any nongovernmental agency. Accordingly, the Department of Defense is legally responsible under CERCLA for cleanup of base sites even aside from other statutory or regulatory requirements for cleanup.

The principal impact of CERCLA is likely to be on the timing of land availability. Even though the U.S. Government may be determined to be the responsible party for base clean-up, funding, bidding and execution of the clean-up effort may take years. In many cases, the full extent of contamination is unknown and a site characterization study is required prior to determination of responsibility. If it is the case that there was joint use between the U.S. Government and a private entity, then determination of responsibility can require a court decision.

One method which has been used to speed up this process, is for the potential recipient of the land to agree to accept the risk and responsibility for clean-up in return for monetary

consideration. The land recipient is often responsible for site characterization and this step would be required prior to their agreement to accept CERCLA risk.

Under favorable conditions, a known contaminated site can require over two years for clean-up and the greatest delay is likely to be in funding this process. In addition, certain clean-up methods such as "pump and treat" or "air sparging" can themselves require several years. These time factors must be taken into account by the site development plan.

Two measures are now pending in Congress which could impact the ability of a local redevelopment authority to encourage development of environmentally suspect sites. First, S. 1285, the *Accelerated Cleanup and Environmental Restoration Act of 1995*, is designed to encourage the development of "brownfields," abandoned sites with hazardous wastes contamination. Lenders and developers are wary of investing in such sites for the fear of successor liability under CERCLA for cleaning up the site. S. 1285 would protect lenders and developers from some Superfund Liability and would help with the costs of assessing the sites by providing interest-free loans to local governments of $100,000 per year, up to $200,000 per site. Second, in the FY97 Defense Authorization Bill (now awaiting conference action), a provision would modify CERCLA for closing military bases. This provision would allow a governor to request an exemption from the CERCLA regulation which does not allow title transfer of property until cleanup has occurred. The DoD would still have the responsibility for cleaning up the property, and the local reuse authority can provide a developer with some additional assurance of an eventual title transfer beyond that already provided by the "lease in furtherance of a conveyance" mechanism.

5.2.3.5 Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA), [Section 103 of PL 92-532]. According to the MPRSA any proposed dumping of dredged material into ocean waters must be evaluated through the use of criteria published by the EPA which describe the applicability of specific evaluative approaches and procedures. These criteria were developed in a joint effort with the Corps of Engineers (USACE) and are promulgated in the so called "Oceans Manual."

This evaluation is generally involves three parts. In the first part an offshore disposal site is identified and benchmarked or characterized to determine its undisturbed state. This characterization process often requires preparation and acceptance of an EIS. Therefore, most projects invoking the MPRSA try to use previously identified sites. In the second part, the material proposed for disposal is tested and evaluated for its potential impact on the designated disposal site. Contaminated dredge spoils are not certifiable for offshore disposal. In the final part, site monitoring is required to determine whether continued use of the offshore disposal site is having a significant negative impact on the area.

5 Planning Considerations

Any dredging with offshore disposal which is proposed for Apra Harbor is likely to trigger the application of MPRSA disposal criteria. Maritime dredging projects which have measurable contamination are often designed to avoid MPRSA jurisdiction. The measures taken to avoid this are:

- Use of in-harbor aquatic disposal sites which are not considered "ocean disposal" and do not fall under jurisdiction of the MPRSA.
- Upland disposal of the contaminated dredged spoils.
- Selective dredging to avoid areas of contamination.

Often a large dredging project will use a combination of these methods to design a cost effective, permitable project.

5.2.3.6 National Pollutant Discharge Elimination System (NPDES), [CFR40-122,123,124]. The NPDES regulations apply only to public and private facilities that discharge storm water via one o more point sources either directly, or through the sewer or storm drain system. A facility is subject to the regulations if it meets the above conditions and falls into any of the following storm water discharges:

- Facilities that engage in an industrial activity
- Large and medium municipal separate storm sewer systems
- Facilities that are determined to have storm water discharges that contribute to a violation of water quality or that are significant contributors of pollutants to waters of the United States.

In addition to the previous facilities, construction operations that result in the disturbance of five acres or more of total land area are also subject to regulation. For the most part, all commercial port construction projects and operations fall into one or more of the above categories. One of the major effects of the NPDES regulations on marine terminals is that wash down water and other contaminated waters must be treated before discharge. If they cannot be treated to an acceptable standard, then they must be legally disposed of in another way.

NPDES also may apply to commercial fish processing plants where water may be used to wash and eviscerate fresh fish. This water is most often discharged directly into the

adjacent harbor without treatment. Under NPDES, this practice is illegal and water so used must be treated prior to discharge.

5.2.3.7 International Convention for the Prevention of Pollution from Ships, (MARPOL 73/78). The United States is signatory to the international agreement known as MARPOL which governs the discharge of wastes by ships at sea. This agreement also regulates how such wastes can be disposed on shore so that they do not become contaminants to the marine environment.

Much of MARPOL is concerned with the design and operation of liquid bulk tankers and does not effect general harbor development in Guam directly, although specific provisions deal with the design and operation of liquid bulk transfer facilities. The MARPOL protocols which are applicable to the harbors of Guam are those which require upland disposal of garbage and oily waste. These requirements include:

- Receiving and disposing of garbage in a MARPOL certified land fill or incinerator
- Pumping and treating contaminated bilge and ballast waters
- Transfer and disposal or reuse of waste oils
- Receiving, treating and proper disposal of oil contaminated solid waste

5.2.3.8 London Dumping Convention. The United States is signatory to the London Dumping Convention which prohibits the disposal of dredged material containing certain identified and listed substances unless those substances can be shown to be trace contaminants or unless they can be rapidly converted in the sea into substances which re biologically harmless. This convention is generally covered by sections 102 and 103 of the Marine Sanctuaries Protection Act.

5.2.4 Miscellaneous Proposed Defense Legislation

5.2.4.1 Limitation on Contractor Performance of Defense Department Depot Maintenance (the "60/40 Rule"), [S. 1745, which would amend 10 U.S.C. § 2466]. Under the current limitation for depot maintenance activities, the Navy is restricted to performance of no more than 40% of this work at non-DoD facilities. Depending on the Navy's future planned mix of public/private depot maintenance, a commercial Ship Repair Facility could be limited by the 40% limitation. The relatively

small size of the Guam SRF will probably eliminate this limitation's impact. The Senate version of the FY97 Defense Authorization Bill now in conference could change the percentages to 50/50, which might eliminate this restriction as a functional issue for Guam. Even if this provision does not pass in the current session of Congress, action is expect in the next session on loosening this restriction.

5.2.4.2 Retirement Benefits of Federal Employees at Privatized Military Industrial Facilities, [S. 1745]. The Senate version of the FY97 Defense Authorization Bill now in conference would provide some retirement relief for employees who go to work for privatization-in-place contractors at closing Defense Department facilities. One of the advantages to privatization-in-place initiatives is keeping the skilled government workforce in place at a location without disruption; however, much of the trained workforce may be forced to consider leaving the facility to preserve federal retirement eligibility. This legislation would allow the employees to accrue years of federal service while working for the privatization contractor. Although this legislation is being pushed for the benefit of other reuse sites, the language authorizes the Secretary of Defense to establish pilot programs for an unspecified number of privatization sites. Guam has the potential to participate in this program if the legislation is approved.

5.3 Shipping Channel Width and Depth Considerations

The width of the Apra Harbor approach channel (the area dredged for access by deep draft ships) must be carefully sized to allow for ships well into the next century. The existing Inner Apra Harbor channel width is approximately 900 feet. However, the existing Outer Apra Harbor channel is narrower being approximately 400 feet wide. In order to provide maximum flexibility in accessing new, future developments in either Inner or Outer Apra Harbors, some additional dredging may be required. While it may be that the Inner Harbor will be used only by smaller ships, (35-foot maximum draft to match existing conditions), the possibility of use by larger ships is considered in the remainder of this section.

To accommodate today's larger container vessels, the recommended access channel should be at least 50 feet below MLLW (mean lower low water). But, it may not necessarily need to be widened in order to accommodate two-way traffic—*the volume of ships per day would probably be low enough to allow a one-way channel.* Figure 5.3 shows the two types of one-way channels at Apra Harbor: (1) The open channel, and (2) the one-side pierhead condition at the access to the Inner Harbor. In the Outer Harbor, the open channel should be 416 to 525 feet wide to accommodate future types of vessels. The U.S. Army Corps of Engineers (USACE) Channel Design Guidelines recommends a typical

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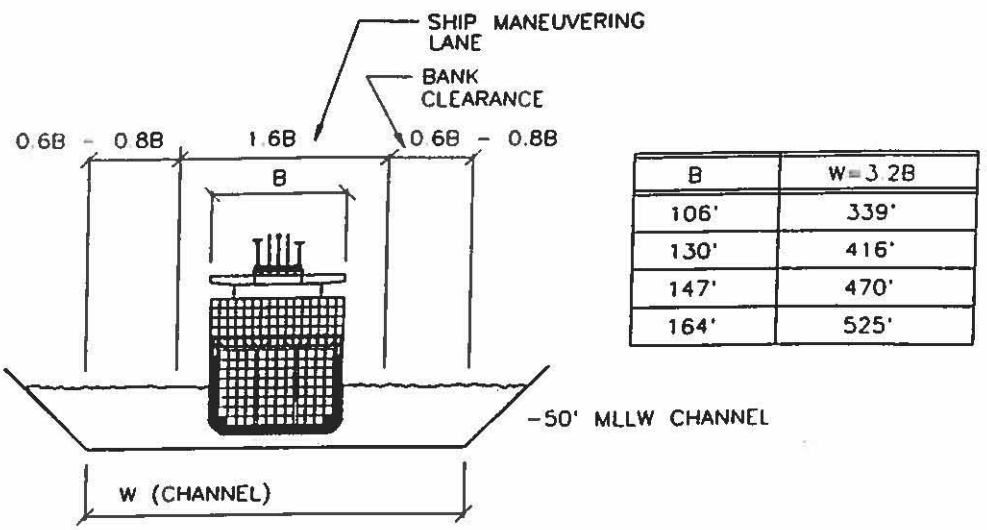
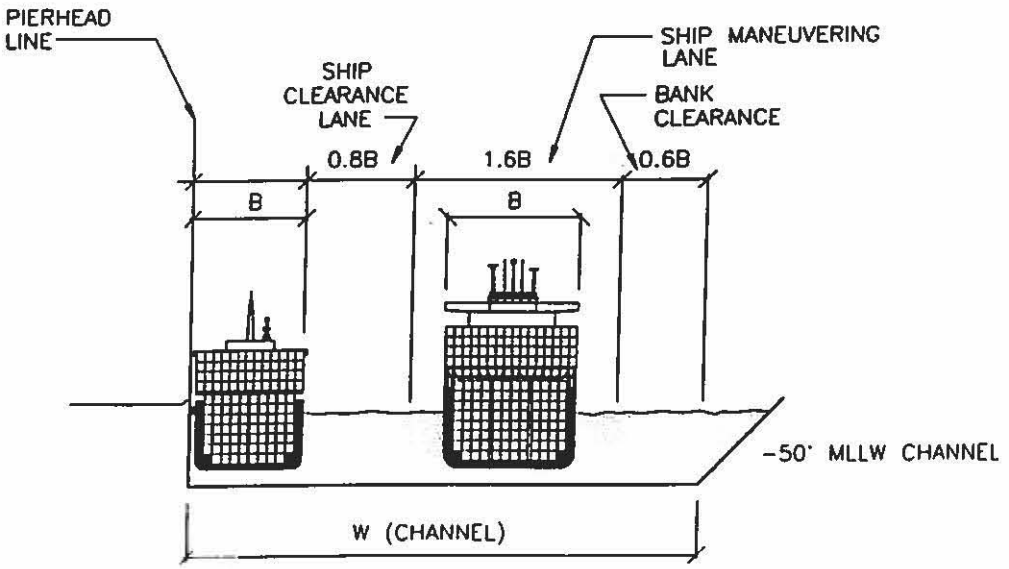


B	W=3.2B
106'	339'
130'	416'
147'	470'
164'	525'

ONE-WAY CONDITION AT OPEN CHANNEL



ONE-WAY CONDITION AT PIERHEAD LINE CHANNEL

Figure 5.3 Channel Widths

one way channel width to be approximately 500 feet. A 500-foot channel width will accommodate a passing C10-type vessel (130-foot beam) while a C9-type vessel (106-foot beam) is berthed on one side of the Apra Harbor channel. The existing 900-foot width is more than adequate at the mouth of the Inner Harbor.

This scenario would require additional dredging to widen the existing channel in the Outer Apra Harbor. Moreover, in order to provide the recommended dredged depth of -50 feet below MLLW, both inner and outer harbor channels would require dredging.

Additionally, the maximum width for the latest generation of post-Panamax vessels must also be considered (currently 17 containers wide—139 to 147 foot beam). It is possible that some shipping lines may go to 18 or 20 wide containers—147 to 164 foot beam—in the future. Hence, it is recommended that these future vessel sizes be taken into consideration prior to any channel widening program.

Finally, if two-way channels are desired, additional dredging and channel widening would be required. However, the costs associated with such an intense dredging program are likely to prove prohibitive and may not justify the return on investment.

5.3.1 Existing Waterways Data

5.3.1.1 Tides and Currents. The mean tidal range at Apra Harbor is 0.3 meters (1 foot), while the spring range is 0.7 meters (2 feet).

5.3.1.2 Channel Width. Current Apra Harbor waterway configurations are presented in Table 5.1 below. References to channel width are at current dredge depth, unless otherwise noted.

Table 5.1
Current Apra Harbor Configurations

Name	Length	Controlling Depth	Channel Width
Outer Apra Harbor Channel	5,250 ft	-45 ft. MLLW	400 ft (Between outer harbor shoals)
Inner Apra Harbor Channel	1,300 ft	-33 to -45 ft. MLLW	900 ft (Between L & Wharf B)

5.3.2 Evaluation of Channel Width and Depth.

Shipping scenarios that were evaluated are based on the expected shipping fleet characteristics and the existing Apra Harbor configuration. The following describes the basic approach and guidelines used in this report:

5.3.2.1 Channel Criteria. Navigation criteria and concerns are vital aspects of any potential development such as those described in this plan for the Inner or Outer Apra Harbors. The following major water use criteria were also reviewed:

Entrance Channel. Design should provide adequate depth and width for the largest anticipated vessels.

USACE Channel Design Criteria and Width Criteria. This criteria should also be validated by the local pilots.

Navigational Traffic Control. Plan for continued development of the existing systems now in use at both the Inner and Outer channels. Pilotage requirements are expected to be similar to those of today or slightly more restrictive for the deeper draft vessels.

Turning Basins. The size of the basins should be adequate for the 800- to 900-foot vessels expected in the harbor. Because of space requirements, maximum turning basins would be provided only when absolutely needed, as when the distance required to back a ship into berth is more than four or five berth lengths, or where it has to be turned around to be moored heading out for safety reasons.

This plan assumes that the disposal of dredged material resulting from the expansion of the waterways and turning basins can be accommodated, or resolved through mitigation.

All channel criteria should be reviewed with representatives of the Port pilots and other Port staff experienced in the development of navigation issues within the harbor. The critical navigational requirements used in this plan were developed based on these assumptions and on a review of the latest published literature from PIANC (Permanent International Association of Navigation Congress) and other sources. Any follow-up planning or development should be reviewed and coordinated with the pilots and other Port staff prior to development of any subsequent plans.

- The channel width criteria was developed primarily for one-way navigation or, two-way navigation for small vessels.

- Water depth criteria was developed to provide suitable under-keel clearance water depth needed to accommodate future vessel sizes that could be expected at the respective berths. These water depth criteria were:

  - Container Vessels: -50' MLLW
  - Break-Bulk Carriers: -35' to -50' MLLW

- Location and orientation of berths are determined to be preliminary and are based on ship type and acceptable ship motion. Berth types and length were varied to suit appropriate ranges of ship sizes for each terminal type.

5.3.2.2 Channel Design Guidelines. Design references used to establish channel guidelines were obtained from various sources, as outlined in the following excerpt from Ports 86 (ASCE 1986):

- The traditional approach to determining channel width required for design vessels is to divide a channel into lanes which serve specific purposes. The width of each lane is specified as a percentage of the design vessel beams (B). This is illustrated for minimum percentages given in document EM-1613 (USACE 1983) in Figure 5.3.

- The maneuvering lane represents the intended swept path of the design vessel(s) allowing for normal steering oscillations, positioning error and effects of cross winds and currents. The bank clearance lane is intended to allow sufficient separation between ship and bank so that excessive rudder angles are not required to counter bank suction effects. The vessel clearance lane is intended to provide a similar margin between maneuvering lanes for meeting or overtaking vessels.

- EM-1613 specified a range of percentages of B for each lane width. For example, the maneuvering lane can range from 160% B to 200% B, depending on designer's judgment. The International Oil Tanker Commission (1973) and the International Commission for the Reception of Large Ships (1980) design recommendations only address large (> 200,000 DWT) vessels and do not employ the lane concept. Their only general recommendation is for a one-way traffic channel width of 500% B.

- In sharp contrast, the (United Kingdom's) National Maritime Institute (1981) does not present general design recommendations. Instead, its design process involves simulator performance evaluations. For the maneuvering lane, its studies (NMI

1981) involving both professional pilots and NMI staff, found that 160% B was sufficient even in strong cross winds.

There is some evidence from similar studies that, by utilizing computer simulation methods, channel widths narrower than those suggested by the traditional Corps of Engineers guidelines can be achieved (PIANC Bulletin 1989, No. 66 and Bulletin No. 87 of April 1995).

5.3.2.3 Channel Alternatives. Using U.S. Army Corps of Engineers criteria, various channel/vessel configurations are possible. The possible alternatives for Apra Harbor include a one-way condition at an open channel and a one-way condition at a pierhead line channel. By using the criteria developed and shown in Figure 5.3, required dimensions can be determined.

5.3.2.4 Future Channel Widening Issues and Costs. Although additional costs would be incurred by dredging a wider channel, consideration should be given to the following issues:

- A 525-foot open channel will accommodate the widest projected future container ships, or a two-way condition for smaller ships.
- Local pilots may desire a wider channel configuration.
- A 500-foot pierhead channel width allow post-panamax vessel berthing while allowing another post-Panamax vessel to pass. The existing 900 foot width at the mouth of the Inner Harbor is more than adequate.

Current maximum width for a post-panamax ship is approximately 139 to 147 feet (17 containers wide). However, there is a possibility that shipping lines will go to 18 or 20 wide (147 to 164 feet) in the future. Therefore, for planning purposes, it would be prudent to allow for 3.2 times 164 feet which equals 525 feet. Using USACE guidelines for a two-way channel at 5.2 times the beam, this would allow two 101 foot wide ships to use the channel. Since 106 foot is very typical Panamax beam, and since wind should not be a common factor in Apra Harbor, it seems prudent to use the 525 foot wide channel for planning purposes. Note that this width could probably be slightly reduced to 470 feet if cost is a major consideration. This would necessitate the use of tugs to reduce navigational risks. Channel widening could thereby occur in a second phase. In fact, if most of the post-Panamax ships of today (C9 or 13 wide, 106 foot beam) were to be accommodated, the existing width is adequate. There are several shoals in the area near the north

edge of the SRF, but it appears that a reasonable access channel and turning basin could be created. Two concepts have been explored. One concept would follow the existing access channel to Inner Harbor. Another concept would come in from the west side of the shoals to access the new wharf basin form the west end. The first concept seems more natural, and consistent with existing traffic patterns, useful for Inner Harbor traffic, and much more conducive to phased development of a cargo terminal wharf at the north edge of the SRF as discussed in Section 7.

5.3.2.5 Existing Channel References. Design criteria employed by the U.S. Army Corps of Engineers were intended to be a guide. Therefore, existing channel configurations of several other ports were examined in order to validate the lane concept of determining channel width.

Port of Tacoma. The 2,500-foot Sitcum Waterway presently maintains container terminals on opposing berths (Terminal 7 and Sea-Land). The distance between the opposing face of piers is approximately 470 feet. The ship clearance lane is equal to .8 of a vessel's beam; therefore, if a vessel of 106-foot beam were berthed at Terminal 7 and Sea-Land and if an additional vessel were to pass between the two berthed vessels, two ship clearance lanes of 84 feet each would be desired. The three vessels' total beam of 318 feet and two ship clearance lanes of 84 feet each add up to 486 feet total clearance desired, which is approximately equal to the existing pier-to-pier distance. However, if the recommended ship-maneuvering lane of 1.6 times the moving vessel's beam were included, a 520-foot channel width would be desired. In summary, a ship's beam x 5.2 is the desired pier-to-pier distance. Therefore, for 106-foot beam ships (C9), the desired pier-to-pier (fender-to-fender) distance is 551-foot. This illustrates a condition in which the channel width is less than that desired by USACE criteria, yet accommodating 106-foot ships on a regular basis.

Port of Los Angeles/Long Beach. The 2020 Master Plan indicates that channels (and pierhead to pierhead dimension) in the proposed project's new landfill areas would have a width of 1,000 feet. The project design criteria called for the use of C10-type vessels and two-way traffic. In determining the channels' desired width, opposing berthed vessels having a beam of 130 feet each were anticipated being passed by two additional vessels having a beam of 130 feet each. The two passing vessels would require 1.6 times their beams for their ship-maneuvering lanes or 208 feet. Clearance of 104 feet between all vessels or .8 of their beams is desired under the utilized guidelines. Therefore, the berthed vessels' beams of 130 feet each (two), the vessels'

maneuvering lanes of 208 feet (two) and the ship clearance lanes of 104 feet (three) all add up to 988 feet, which is approximately the 1,000-foot design width.

Other ships waterways/channels which could be examined are:

Long Beach Channel:	1,000'	(approx.)
Los Angeles Main Channel:	1,000'	(approx.)
Port of Long Beach Sea-Land/ITS:	865'	(approx.)
Port Authority of New York/New Jersey:		
Elizabeth Channel:	800'	(approx.)
Port Newark Channel:	800'	(approx.)
Oakland Estuary:	800'	(approx.)

5.3.3 Turning Basin Recommendations

Recommendations for turning basin geometry vary greatly, from 100 feet added to each end, to 1.5 times the vessel length for tug-assisted vessel turning. Local pilots have recommended adding 100 to 150 feet at each end. Using this criterion for a 1,050-foot design ship (assuming future fifth generation container vessel), the minimum turning basin should be 1,350 feet. This provides a turning basin to vessel ratio of 1.29. Therefore, it is reasonable to use a 1.3 ratio for conceptual design purposes.

Figure 5.4 demonstrates the required turning basin geometry for typical third and fourth generation container vessels (APL, C9 and C10) and for the newer fifth generation vessel (C11). Please note that smaller turning basins are successfully used today. For example, in Oakland, APL routinely turns its 903-foot C10 in a 1,100-foot turning basin. This is a ratio of 1.22.

5.4 Planning Using Functional Facility Modules

Ten terminal modules were used to evaluate the land and infrastructure requirements for the redevelopment of Apra Harbor. The modules are intended to serve two purposes. First, each module represents an ideal example of the design and standard conditions under which a port can operate. They are useful as planning guidelines for port development. Second, each module is flexibly designed so that it can be adjusted to meet a variety of site configurations. The ten facility modules are:

- Container Module—Wheeled
- Container Module—Rubber-Tired Gantry (RTG)/Wheeled

5 Planning Considerations

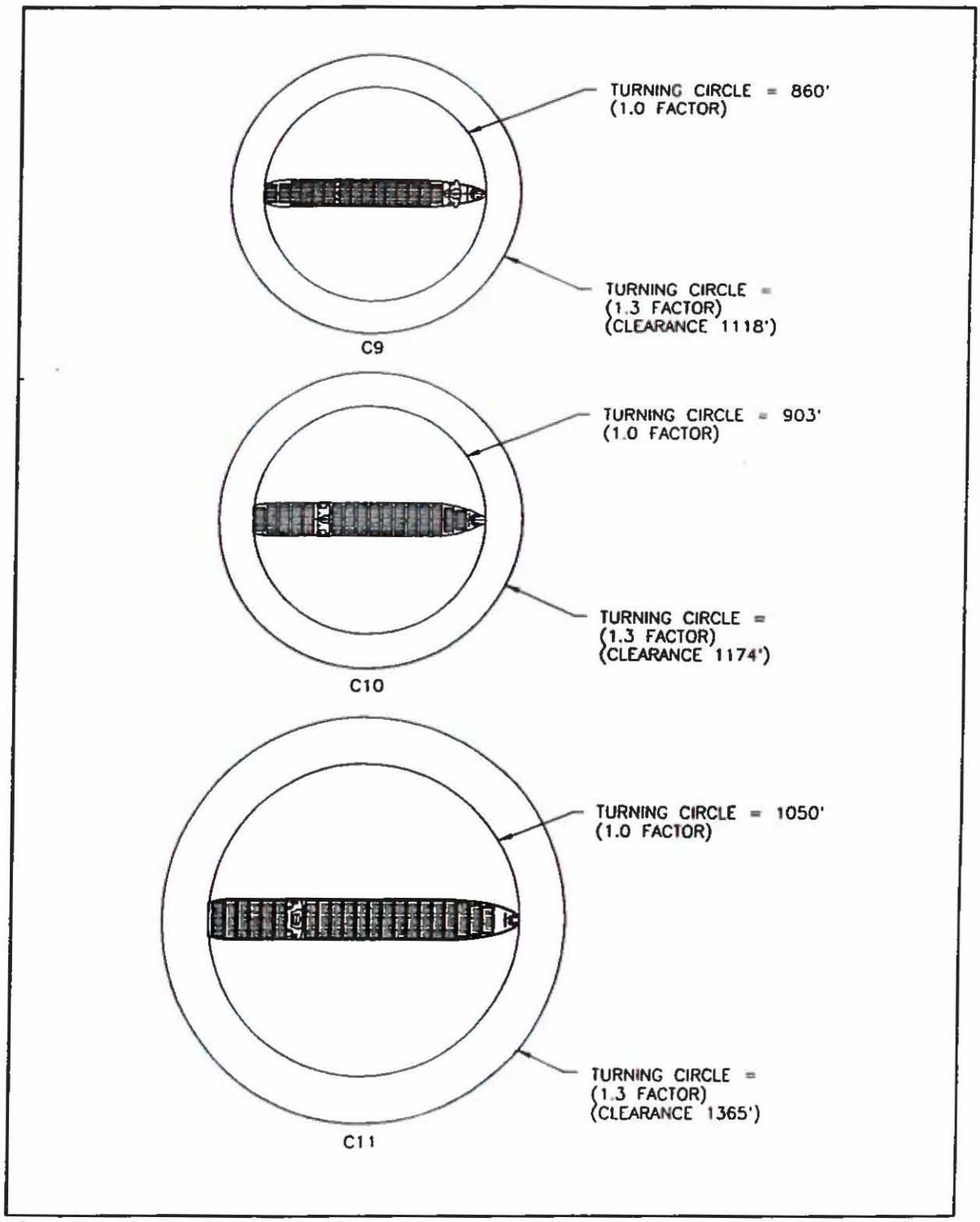


Figure 5.4 Turning Basins

- Container Module—Forklift Truck (FLT)/Wheeled
- Transshipment Module—RTG and Wheeled
- Transshipment Module—FLT and Wheeled
- General Cargo-Break Bulk/Neo Bulk Module
- Liquid Bulk Petroleum Module
- Passenger/Cruise (Home port) Module
- Excursion Cruise Module
- Fishery Module

Each of these modules are associated with average throughput characteristics based on typical industry standards. A critical caveat, however, is that the modules are intended to be used for planning long-term development. As such they represent *state-of-the-art terminal prototypes assuming full build-out on an unimproved site*. Hence, they will represent larger footprints and throughput capabilities than needed at Apra Harbor, particularly in the short-term. The programmatic cost estimates for each module shown in Appendix C must be used with utmost caution as they are likely to be higher than needed for Apra Harbor since Apra is a developed port with many of the infrastructures and facilities already in-place. At Apra, renovation, expansion, or improvements are more likely required than a ground up construction of a complete new terminal module.

The modules were used in this plan in the following manner:

- Each candidate development area analyzed in terms of the various facility modules that depict ideal spatial requirements in order to gauge the feasibility of fitting that module's function into the available area.

- The modules were also used to determine the benefits and costs associated with using existing buildings and infrastructures at each site.

- Although in some areas the modules did not precisely fit, they could be expected to operate effectively. These conditions are possible since the modules are intended to be flexible enough to permit a variety of wharf and site configurations. Hence, the modules are not "pasted" onto the Apra Harbor site drawings, to preclude an impression that the modules are rigid in layout and size.

- The modules were used as guidelines for preparing cost ranges according to the environment at each site, in addition to the long term goals and needs for the port.

- Because of the relative flexibility of the modules, different uses suggested in the long- and short-term plans can be combined. For example, it is possible to take appropriate proportions of the Break Bulk module and combine it with a portion of the Fishery module, to create a multi-user terminal area.

The modules were used to verify that the scenarios suggested and/or shown in this plan would be functionally sound.

5.4.1 Container Module—Wheeled

The 82-acre wheeled container module shown on Figure 5.5 is used for the transfer of containerized cargo and unitized ro-ro cargoes such as trailers, Mafis and construction equipment. Table 5.2 represents an example of some of the major infrastructure generally required for this type of facility.

Table 5.2
Containerized Cargo Terminal, Infrastructure Requirements

Vehicular Traffic Per Day (RT = 2 trips)	1,025
Percent of Traffic that is Truck	83%
Parking Spaces Required	90
Electrical Power	10,000-12,000 KVA
Crane 1,000 KVA x 6	6,000 KVA
Reefers	1,000 - 2,000 KVA
Lighting	1,000 KVA
Buildings	1,000 - 2,000 KVA
Miscellaneous	1,000 KVA
Potable Water	260 gpm
Fire Water	20 - 22 hydrants, 2,500 gpm
Telephone/communications	6 lines
Sanitary sewer	10" line
Storm sewer	3, 48" outfalls
Special utilities	Paging and computer
Special right-of-way	N/A

This module has been designed to serve the needs of a medium to large container terminal with largely wheeled storage to provide the maximum level of customer service. Some of

5 Planning Considerations

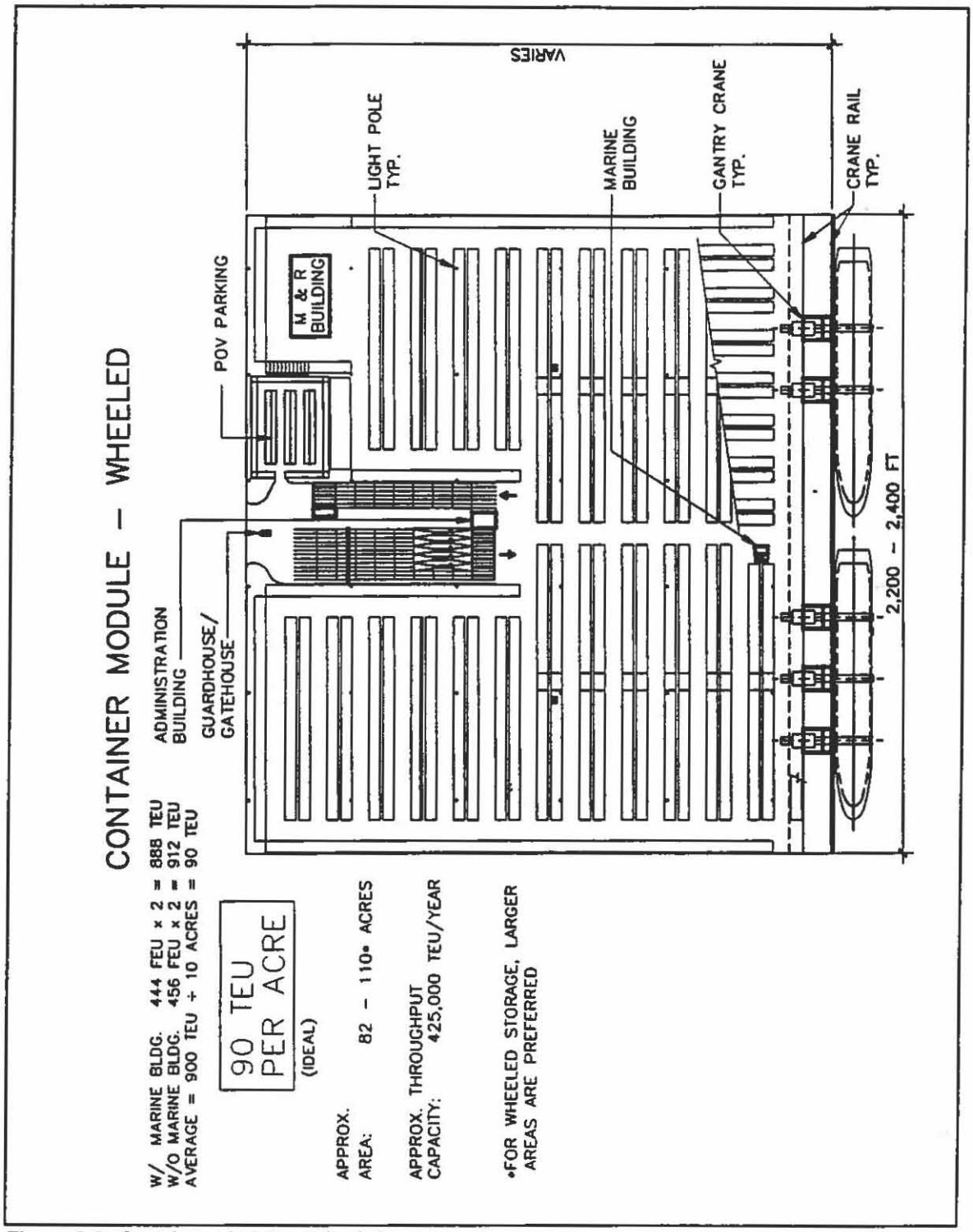


Figure 5.5 Container Module—Wheeled

the additional major terminal components that may be required, that are shown on the module, include:

- Two berths, able to accommodate container vessels up to 900 feet in length.
- Six, 100-foot-gauge container gantry cranes or mobile cranes at the marginal wharf. More cranes could be considered if this berth is to be used by more than one module.
- Approximately 60 acres of paved and striped outdoor storage with a static capacity for approximately 5,400 TEU (functionally equivalent to 3,175 containers at 1.7 TEU per unit).
- An administration building, maintenance and repair facility and fenced parking for both longshore and administrative personnel.
- A fourteen-lane split terminal gate for weighing loads and documenting cargo interchange transactions.

Vessels are assumed to transfer approximately 2,000 TEUs per call, or approximately 60 to 80 percent of their total capacity. At approximately 40 containers per hour, a typical vessel could complete its cargo transfer plus its lashing/unlashing operation in approximately 16- to 24-hours.

At 2,000 TEUs per call, 213 vessel calls per year (or approximately four calls per week) would be required to move 425,000 TEUs of cargo annually. This results in a relatively high rate of berth utilization (for a scheduled service). Container terminals generally require a higher level of security, therefore, this module might not share berthing with any other modules, except for another container terminal or perhaps an automobile terminal.

On average, this module can be expected to turn two-thirds of its storage capacity over approximately once a week, or 52 times per year, for an annual throughput of 425,000 TEUs. The one-third reserve storage area, as well as the static capacity of almost three times the average calling vessel's anticipated cargo transfer, allows for short-term as well as seasonal peaking.

5.4.2 Container Module—Rubber-Tired Gantry (RTG)/Wheeled

The 82-acre RTG/wheeled container module shown on Figure 5.6 is used for the transfer of containerized cargo and utilizes a very high density storage mode using high efficiency rubber tired gantry cranes. Wheeled storage is also provided in the backlands area of the terminal for shorter dwell cargoes and cargoes requiring greater selectivity. Major infrastructure requirements are identical to that for the Wheeled Container Module shown at Table 5.2.

This module has been designed to represent the needs of a medium to large container terminal with largely high density stacked storage to provide the maximum level of storage and throughput capability. Some of the additional major terminal components that may be required, that are shown on the module, include:

- Two berths, able to accommodate container vessels up to 900 feet in length.
- Six, 100-foot-gauge container gantry cranes or mobile cranes at the marginal wharf. More cranes could be considered if this berth is to be used by more than one module.
- Approximately 32 acres of paved and striped outdoor storage for RTG cranes with a static capacity for approximately 6,720 TEU (functionally equivalent to 3,950 containers at 1.7 TEU per unit). In addition, there are approximately 320 TEU of RTG reefer storage (stacked at 1.5 high) available.
- Approximately 28 acres of paved and striped outdoor storage for wheeled operations with a static capacity for approximately 3,050 TEU (functionally equivalent to 1,795 containers at 1.7 TEU per unit).
- An administration building, maintenance and repair facility and fenced parking for both longshore and administrative personnel.
- A fourteen-lane split terminal gate for weighing loads and documenting cargo interchange transactions.

Vessels are assumed to transfer approximately 2,000 TEUs per call, or approximately 60 to 80 percent of their total capacity. At approximately 40 containers per hour, a typical vessel could complete its cargo transfer plus its lashing/unlashing operation in approximately 16- to 24-hours.

At 2,000 TEUs per call, 213 vessel calls per year (or approximately four calls per week) would be required to move 425,000 TEUs of cargo annually. This results in a relatively high rate of berth utilization (for a scheduled service). Container terminals generally require a higher level of security, therefore, this module might not share berthing with any other modules, except for another container terminal or perhaps an automobile terminal.

On an average, this module can be expected to turn 100 percent of its storage capacity over approximately once a week, or 52 times per year, for an annual throughput of 425,000 TEUs. The one-third reserve storage area, as well as the static capacity of almost five times the average calling vessel's anticipated cargo transfer, allows for short-term as well as seasonal peaking.

5.4.3 Container Module—Forklift Truck (FLT)/Wheeled

The 82-acre FLT/wheeled container module shown in Figure 5.7 is used for the transfer of containerized cargo and utilizes a high density storage mode using forklift trucks. Forklift trucks offer ease of operation and are highly efficient. Wheeled storage is also provided in the backlands area of the terminal for shorter dwell cargoes and cargoes requiring greater selectivity. Major infrastructure requirements are identical to that for the Wheeled Container Module shown at Table 5.2.

This module has been designed to represent the needs of a medium to large container terminal with largely wheeled storage to provide the maximum level of customer service. Some of the additional major terminal components that may be required, that are shown on the module, include:

- Two berths, able to accommodate container vessels up to 900 feet in length.
- Six, 100-foot-gauge container gantry cranes or mobile cranes at the marginal wharf. More cranes could be considered if this berth is to be used by more than one module.
- Approximately 30 acres of paved and striped outdoor storage for FLTs with a static capacity for approximately 4,850 TEU (functionally equivalent to 2,850 containers at 1.7 TEU per unit). In addition, there are approximately 160 TEU of FLT reefer storage (stacked at 1.5 high) available.

5 Planning Considerations

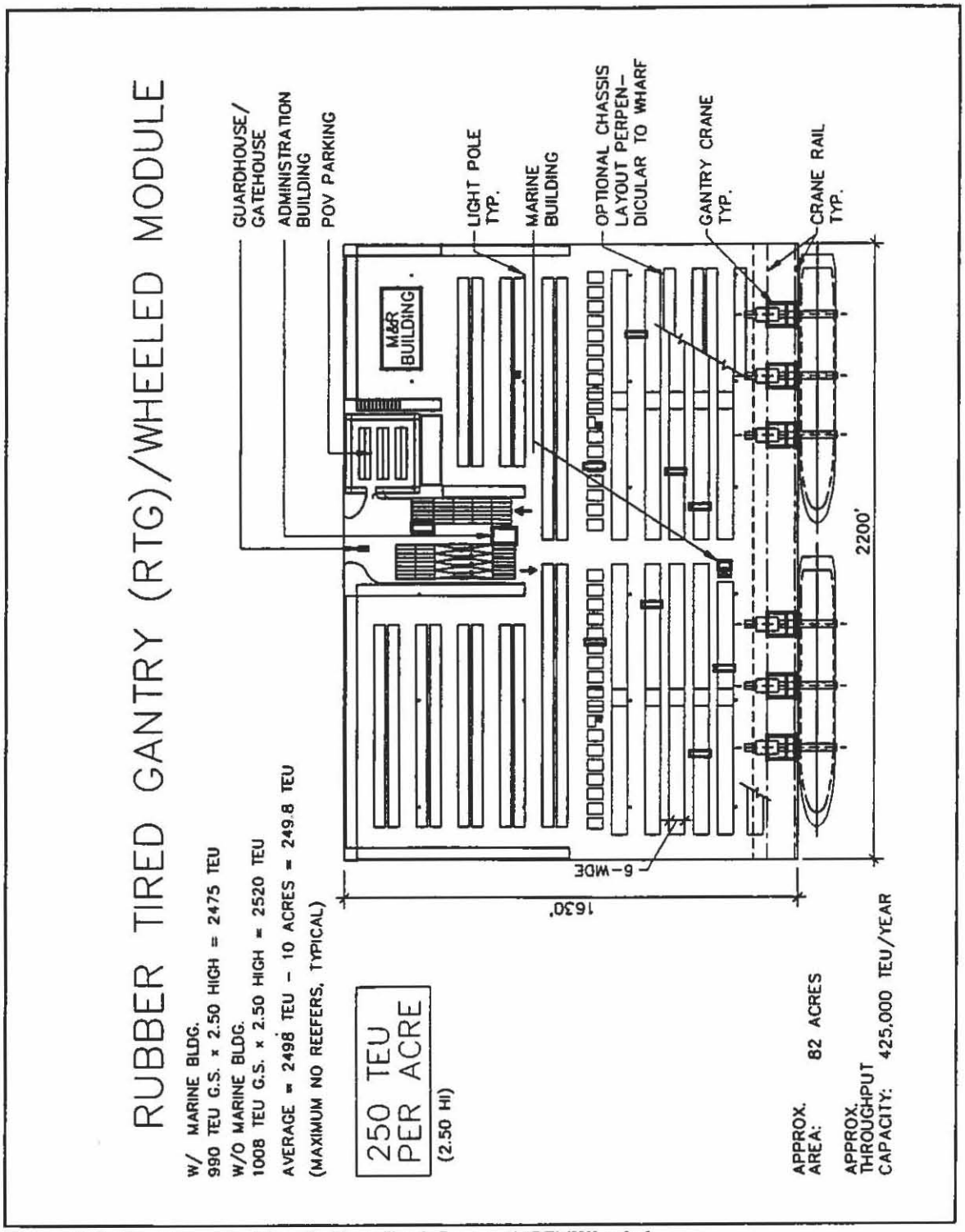


Figure 5.6 Container Module—Rubber-Tired Gantry (RTG)/Wheeled

5 Planning Considerations

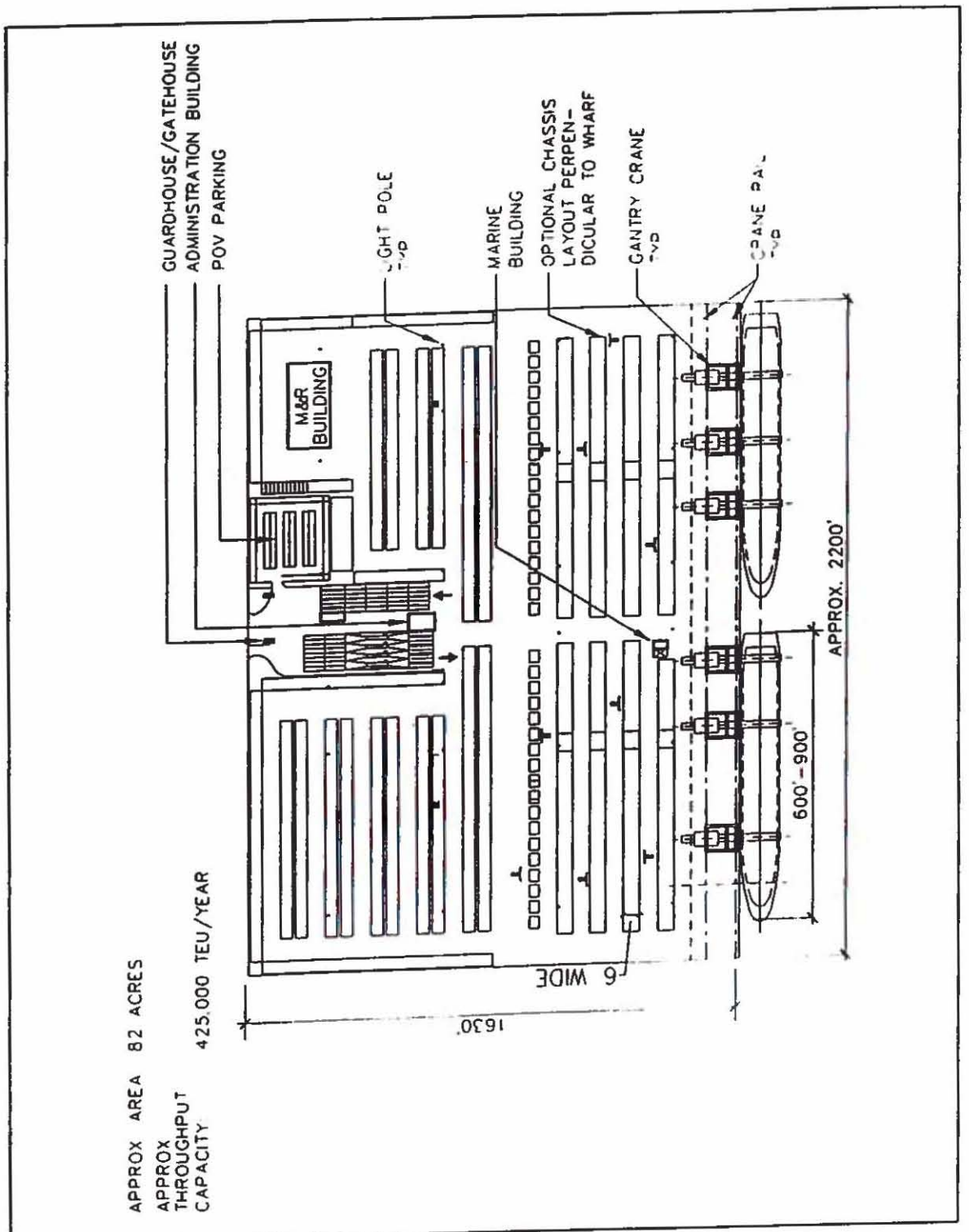


Figure 5.7 Container Module—Forklift Truck (FLT)/Wheeled

- Approximately 28 acres of paved and striped outdoor storage for wheeled operations with a static capacity for approximately 3,050 TEU (functionally equivalent to 1,295 containers at 1.7 TEU per unit.)

- An administration building, maintenance and repair facility and fenced parking for both longshore and administrative personnel.

- A fourteen-lane split terminal gate for weighing loads and documenting cargo interchange transactions.

Vessels are assumed to transfer approximately 2,000 TEUs per call, or approximately 60 to 80 percent of their total capacity. At approximately 40 containers per hour, a typical vessel could complete its cargo transfer plus its lashing/unlashing operation in approximately 16- to 24-hours.

At 2,000 TEUs per call, 213 vessel calls per year (or approximately six calls per week) would be required to move 425,000 TEUs of cargo annually. This results in a relatively high rate of berth utilization (for a scheduled service). Container terminals generally require a higher level of security, therefore, this module might not share berthing with any other modules, except for another container terminal or perhaps an automobile terminal.

On an average, this module can be expected to turn 100 percent of its storage capacity over approximately once a week, or 52 times per year, for an annual throughput of 425,000 TEUs. The one-third reserve storage area, as well as the static capacity of almost three-and-one-half times the average calling vessel's anticipated cargo transfer, allows for short-term as well as seasonal peaking.

5.4.4 Transshipment Module—RTG and Wheeled

The 55 acre modules shown in Figures 5.8 and 5.9 are used for the transshipment of containerized cargo from vessel to vessel rather than from vessel to shore destinations. Table 5.3 represents an example of some of the major infrastructure generally required for this type of facility.

Therefore, there is more berth length available for a given amount of storage than normally would be encountered in a typical container facility. Since the cargo does not leave the terminal by truck, most of the storage is in either top-pick fork lift truck (FLT) or rubber tired gantry (RTG) mode. A small amount of wheeled storage is included in this

5 Planning Considerations

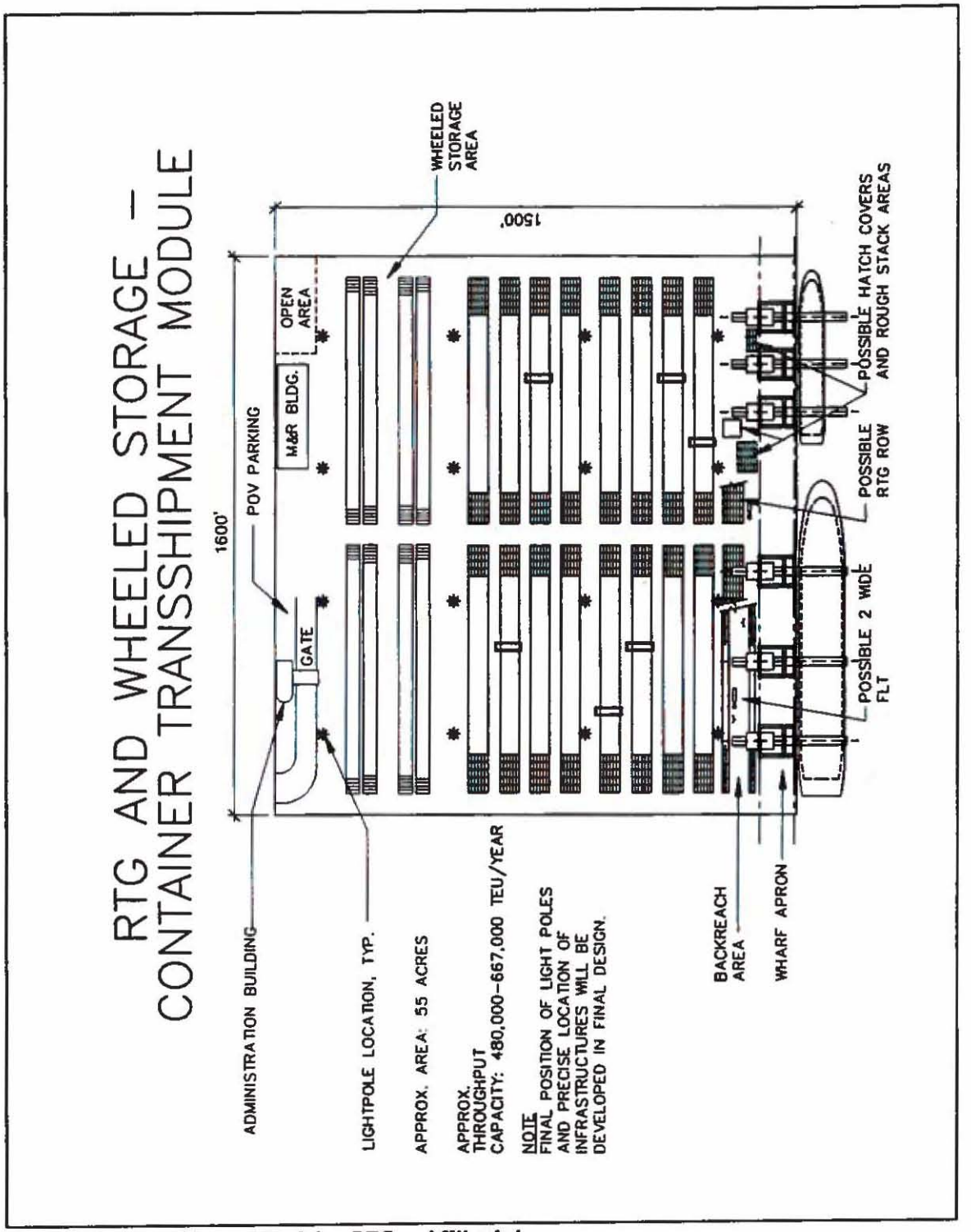


Figure 5.8 Transshipment Module—RTG and Wheeled

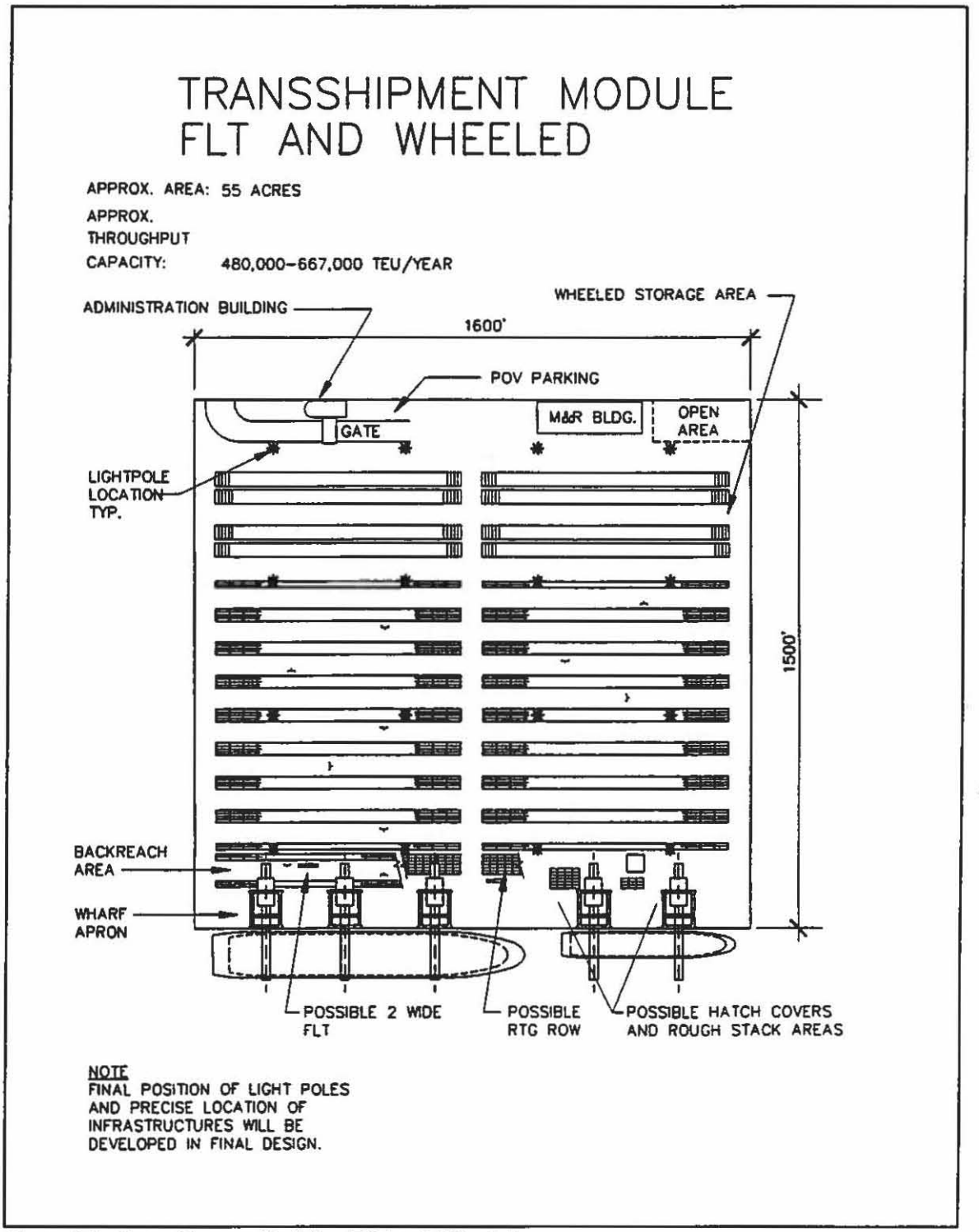


Figure 5.9 Transshipment Module—FLT and Wheeled

module to handle incidental local cargo. The transshipment module characteristics and performances are as follows:

- Dimensions: 1,600' X 1,500'; 55 acres
- Throughput: 480,000 to 667,000 TEU per Year

These modules have been designed to represent the needs of a mixed-use transshipment terminal with largely grounded (static) storage to provide the maximum container density for transshipment as well as wheeled storage to allow local cargo to be discharged by calling vessels. The major terminal components that are shown on the module include:

- A large berth for transoceanic vessels (could be shared with another transshipment module), able to accommodate container vessels up to 950 feet in length. (Note: this berth could also accommodate one or two feeder vessels when not otherwise utilized.)
- A smaller berth for local feeder vessels (could be shared with another transshipment module), able to accommodate vessels of about 500 feet in length.
- Five or six 100' gauge, container gantry cranes at the marginal wharf. Six cranes are preferable if this terminal uses RTG storage.
- 26 acres of paved outdoor grounded container storage with a static capacity for about 3,900 TEU in the FLT mode or 5,200 TEU in the RTG mode.
- 10 acres of paved and striped outdoor wheeled container storage with a static capacity for about 375 wheeled stalls or 750 TEU at 2 TEU per stall.
- An administration building, a small maintenance and repair (M&R) facility, and fenced parking for both longshore and administrative personnel.
- A small (two to four lane) terminal gate for incidental local cargo.

Transoceanic vessels are assumed to transfer (discharge and load) about 2,200 TEUs per call or about 75% of their total capacity. Feeder vessels are expected to transfer most of their capacity off and on, or about 150%, for about 900 TEU per call. An optimum operation would require slightly over two feeder vessel calls for each transoceanic vessel call. Liner vessels would call about three times per week, utilizing the berth slightly less than 50% of the time. However, at least one feeder vessel would be at berth every day.

Therefore, a high overall berth utilization could be expected and adjacent terminals could benefit greatly by sharing berths.

Table 5.3
Containerized Cargo Terminal
Transshipment Infrastructure Requirements

Vehicular Traffic Per Day (RT = 2 trips)	200 - 300
Percent of Traffic that is Truck	83%
Parking Spaces Required	75
Electrical Power	10,000 - 12,000 KVA
Crane 1,000 KVA x 5 x 6	5,000 - 6,000 KVA
Reefers	1,000 - 2,000 KVA
Lighting	1,000 KVA
Buildings	1,000 - 2,000 KVA
Miscellaneous	1,000 KVA
Potable Water	180 gpm
Fire Water	15 - 18 hydrants, 2,500 gpm
Telephone/communications	6 lines
Sanitary sewer	10" line
Storm sewer	2, 48" outfalls
Special utilities	Paging and computer
Special right-of-way	N/A

Transshipment cargo dwell times (days at the port) are determined by the rotation schedule of the calling vessels. This is different from local containerized cargo, which dwells at the terminal until the consignee picks it up. On the average, these modules can be expected to turn their storage capacity over about 60 times per year, for an annual throughput of 480,000 to 667,000 TEUs. The wheeled storage areas, as well as the static capacity of almost three times the maximum calling vessels anticipated cargo transfer, allows for short term and seasonal peaking.

5.4.5 General Cargo-Break Bulk/Neo Bulk Module

The 10-acre general cargo-break-bulk/neo bulk module is shown on Figure 5.10 and is used for palletized break-bulk cargoes such as bagged cereals, plywood and paper, as well as neo bulk cargoes like steel coil and newsprint. Table 5.4 represents an example of

major infrastructure generally required for this type of facility. This module includes covered storage for cargo requiring protection from the weather and open storage for less weather-sensitive cargo. The module characteristics and performance specifications are as follows:

- Dimensions: 650' x 670'; 10 acres
- Throughput: 150,000 short tons per year

Table 5.4
General Cargo/Break Bulk/Neo Bulk Terminal Infrastructure Requirements

Vehicular Traffic Per Day (RT = 2 trips)	15 - 20
Percent of Traffic that is Truck	87%
Parking Spaces Required	20
Electrical Power	1,000 - 4,000 KVA
Reefers	1,000 KVA
Lighting	1,000 KVA
Buildings	1,000 KVA
Miscellaneous	1,000 KVA
Natural Gas	4" line
Potable Water	6" line
Fire Water	8" line (3 hydrants, 2,500 gpm)
Telephone/communications	4 lines
Sanitary sewer	8" line
Storm sewer	1, 36" outfall
Special utilities	Paging system

This module is designed to represent the needs of a small break-bulk terminal with moderate throughput levels for a large variety of cargoes. Some automobile deliveries could be shared and handled at this module. The possibility exists for approximately 5-6 acres of this General Cargo facility to be dedicated for Automobiles. The average automobile throughput per year is 3,500 units per acre, or approximately 17,500-21,000 units per year. The major terminal components that are shown on the module include:

- A single berth (could be shared with another module), able to accommodate vessels up to 550 feet in length.

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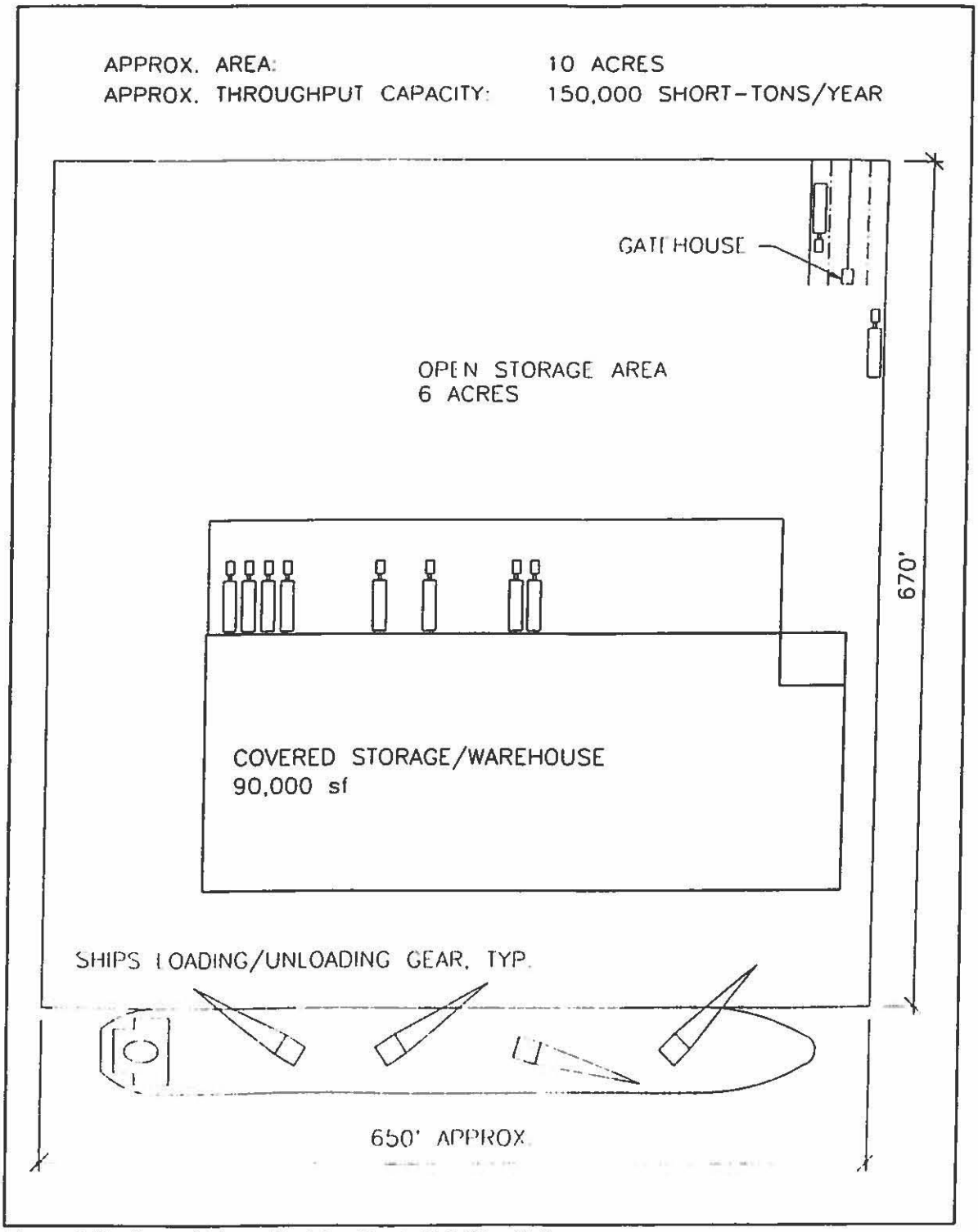


Figure 5.10 General Cargo Module—Break Bulk/Neo Bulk

- A 90,000-square-foot transit shed having a static storage capacity of approximately 4,500 short tons. The shed includes forklift access and truck loading bays.

- Six acres of paved, outdoor storage with a storage capacity of approximately 10,000-15,000 short tons.

Vessels are assumed to transfer 16,000 short tons of product per call at one vessel call every two weeks. Although a typical vessel could complete its cargo transfer in one 24-hour period, most small break-bulk terminals are operated only eight to 12 hours per day. Therefore, it could take two to three days to turn the vessel. This results in a berth utilization of approximately 12.5%, allowing other terminal modules to share the berth area.

On an average, this module can be expected to turn its storage capacity over approximately 15 times per year, for an annual throughput of 150,000 short tons. A static capacity of less than two times the average calling vessel's anticipated cargo transfer will allow very limited short-term peaking. Longer-term (seasonal) peaking can be accommodated through increased vessel calls and faster storage turnover.

5.4.6 Liquid Bulk Petroleum Module

The 15-acre petroleum module is shown on Figure 5.11 and is used for general liquid bulk for this study. The module characteristics and performance specifications are as follows:

- Dimensions: 800' x 800'; 15 acres
- Throughput: 1,500,000 short tons per year

Table 5.5 represents an example of some of the major infrastructure generally required at this type of facility.

This module is designed to encompass the needs of an average light petroleum product-receiving terminal with moderate throughput levels. Some of the major terminal components that may be required, that are shown on the module, include:

- A single berth (could be shared with another module), able to accommodate vessels up to 700 feet in length.

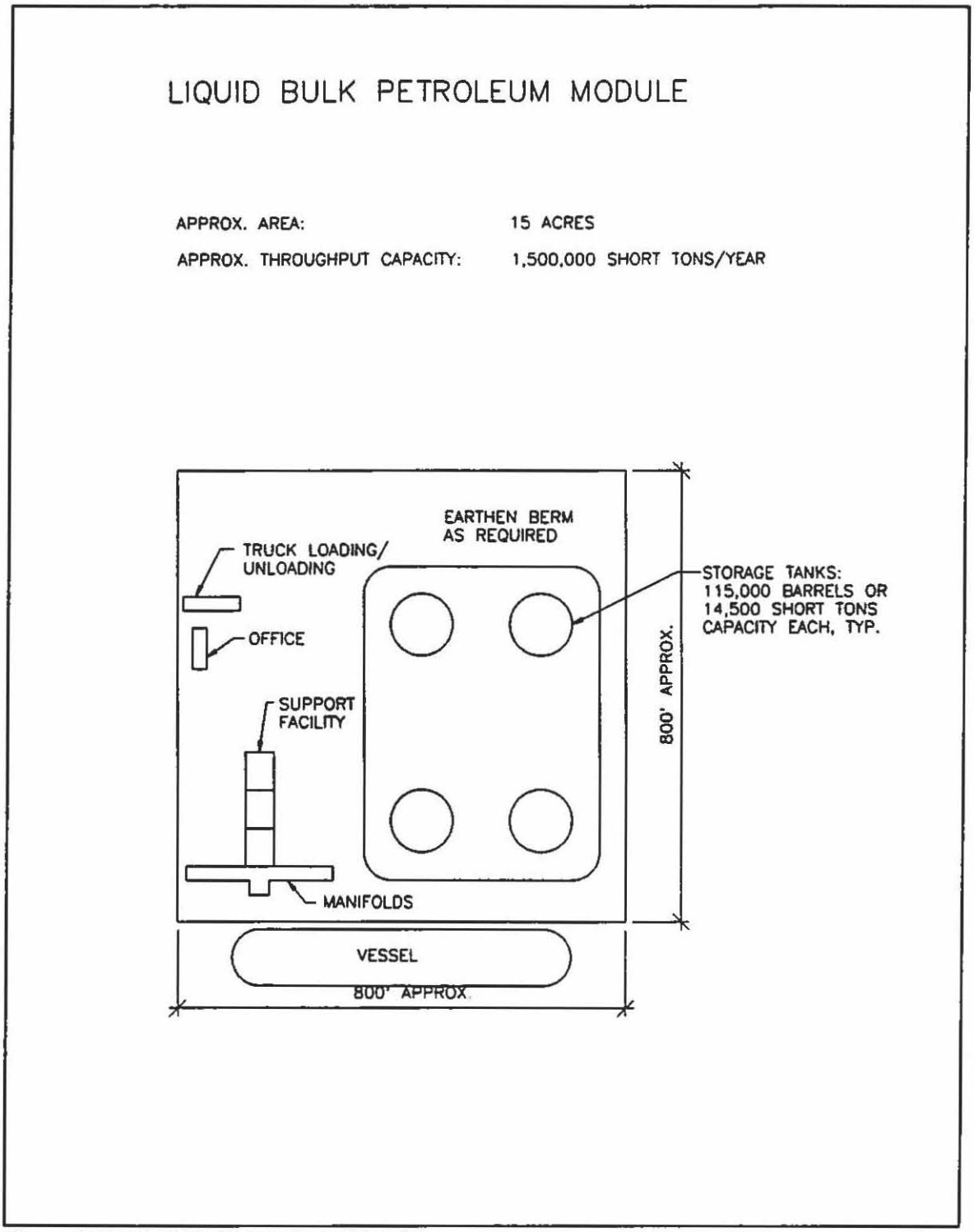


Figure 5.11 Liquid Bulk Petroleum Module

- A product manifold which could be simple recessed risers or some type of permanent, articulated pipe assembly.
- Four tanks having a total capacity of 460,000 U.S. petroleum barrels or approximately 58,000 short tons of light (8 bbl./ton) product.
- A six-lane truck-loading canopy.

Typical terminal operations for a petroleum liquid bulk terminal were used to prepare this module. Vessels are assumed to transfer 19,000 to 20,000 short tons of product per call at approximately one or two vessel calls per week. Two cargo transfer pumps are used, each having a capacity of approximately 500 short tons an hour. This enables a typical vessel to complete its port call in one 24-hour period.

A typical unscheduled berth occupancy rate is from 25% to 30% for small marine terminals. Since one 24-hour call per week represents a 14.3% occupancy, it is possible that two terminal modules could share a single berth.

Table 5.5
Liquid Bulk Petroleum
Infrastructure Requirements

Gross Terminal Area	15 acres
Storage Capacity Area	varies
Throughput capacity	Short Tons/Year: 1,500,000
Wharf Apron Configuration	Length: 800'; Width: 100'
Channel criteria	Depth: 45', width: 500' minimum, 700' preferred
Basic geometry depth	Depth: 45' min; 48' preferred
Storage Area/Tank Capacity	Tanks-115,000 barrels/14,500 ST
Surge Capacity Tank Requirements	varies
Transfer equipment	Product manifolds, recessed risers, or articulated hoses
Road requirements	Tank truck
Hazardous cargo areas	All
Safety criteria	OSHA, NFPA, AP1620, 650, 01A

On an average, this module can be expected to turn its storage capacity over every two weeks for a throughput of 1.5 million short tons per year. A static capacity of approximately three times the calling vessel's anticipated cargo transfer is provided to allow for short-term peaking. Longer-term (seasonal) peaking can be accommodated through increased vessel calls and faster storage turnover.

5.4.7 Passenger/Cruise (Home port) Module

The 7.5 acre Home Port cruise terminal module is shown on Figure 5.12 and is used for passenger vessel calls requiring ship services, baggage handling, customs processing and passenger check-in. Although this type of terminal is intended to provide home port service to vessels with cyclic itineraries, it could also be used to accommodate relocation calls and world itinerary cruises. In addition, Port-of-call vessels can make use of a vacant Home Port berth. The module characteristics and performance specifications are as follows:

- Dimensions: 300' X 1,100'; 7.5 acres
- Throughput: 230,000 Booked (one way) Revenue Passengers per Year

This module is designed to represent the needs of a Home Port terminal with moderate throughput levels. Some of the major terminal components that are shown on the module include:

- A single berth able to accommodate vessels up to 1,000 feet in length (could accommodate two smaller vessels).
- 300' to 400' for one-way ship traffic. 50' - 700' for two-way ship traffic. (Assumes 100' beam on design vessel)
- One or two movable gangways able to accommodate 300 to 500 passengers per hour.
- One passenger boarding lounge having a total capacity of 1,300 passengers.
- One luggage claim and customs clearance area having a total capacity of 4,000 passengers.
- A bus and taxi loading area having a capacity of 12 busses and six taxis.

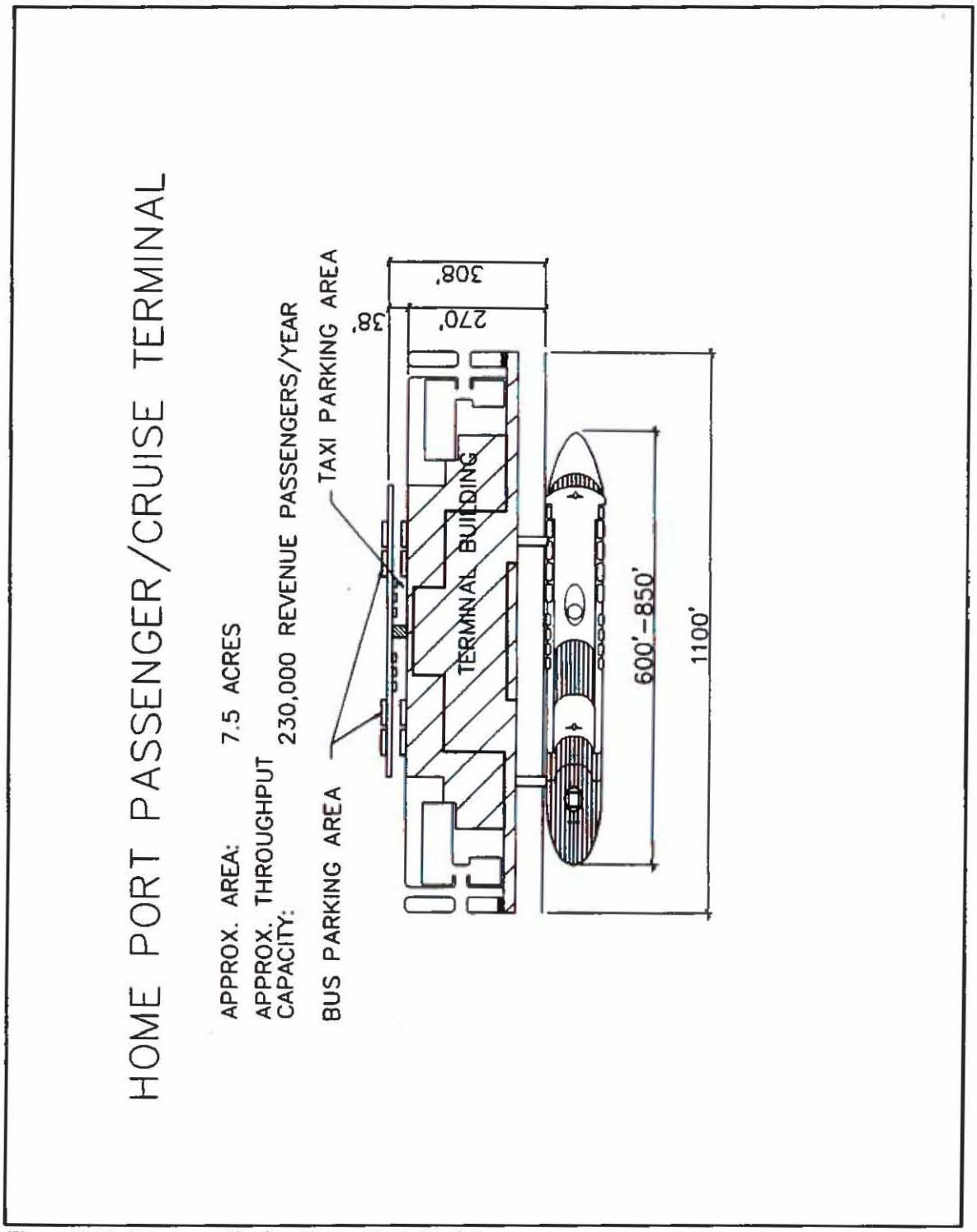


Figure 5.12 Passenger/Cruise (Home Port) Module

5 Planning Considerations

Tables 5.6 and 5.7 represents an example of some of the major infrastructure generally required at this type of facility.

Table 5.6
Home Port Passenger/Cruise Terminal
Facility Data

Total Gross Area	7.5 acres 1,100' marginal wharf-850' min 50' min setback-structures
Throughput capacity	230,000 revenue passengers/year
Terminal building	150,000 square feet
Storage Area (covered)	10,000 square feet (incl in Terminal Bldg)
Transfer equipment	Forklift: 4 @ 2.5 tons each
Special requirements	· ADA requirements · Vessel sewage discharge infrastructure allowance · Minimize passenger walking distance · Visitor information kiosks · Covered parking for 5, 55' tour buses @ terminal · Band
Safety criteria	Highest standard
Hazardous cargo area	Foreign flag vessels - garbage dumpster
Road requirements	Road access
Channel criteria	Depth: 33' min; 35' preferred Width: 300' min; 400' preferred*
Building areas	Office, toilets, lounge, waiting areas, phones and customs included in terminal building area
Additional Service needs	Fresh stores - fuel

Table 5.7
Home Port Passenger/Cruise Terminal Infrastructure Requirements

Electrical Power	3,000 KVA
Lighting	1,000 KVA
Buildings	1,000 KVA
Miscellaneous	1,000 KVA
Natural Gas	N/A
Potable Water	6" line
Fire Water	8" line (5 hydrants, 2,500 gpm)
Telephone/communications	12 lines
Sanitary sewer	8" line
Storm sewer	24" outfall
Special utilities	Paging system
Parking spaces required	· 6 full size tour buses under cover @ terminal · Remote queue for an additional 5 tour buses · Minimum-passenger vehicles · 6 taxi stations
Special right-of-way requirements	Public coastal access

Vessels are assumed to transfer an average of 1,728 passengers per call at two to four vessel calls per week depending on the season. Although a typical home port vessel is only in port for ten to twelve hours, most cruises originate and conclude on the weekends. Therefore, berth utilization averages 50% or less, even during the peak season. This means that port-of-call vessels could use the berth during the week when no home port vessels were scheduled.

On an average, this module can be expected to accommodate all of the passengers and baggage at once in the baggage claim area. However, if a large cruise vessel calls, then two baggage "claims" will be required upon passenger departure.

5.4.8 Excursion Cruise Module

The 4 acre terminal shown at Figure 5.13 is designed to comfortably and efficiently facilitate passenger throughput. Typical infrastructure requirements are listed in Table 5.8.

Table 5.8
Excursion Cruise Terminal
Infrastructure Requirements

Total Gross Area	1.5 acres
	140' wharf
	30' wharf apron
Throughput capacity	Approximately 100,000 revenue passengers per year
Terminal building	4,400 square feet
Storage Area	1,000 square feet
Special requirements	Portable gangways; ADA reqts
Road requirements	Road access
Channel criteria	Depth: 20', Width: 150'
Basic Geometry Depth	Depth: 20' minimum; 60' existing
Building areas	Office, toilets, waiting areas, phones
Electric power	300 KVA
Lighting	200 KVA
Building	100 KVA
Potable water	3" line
Fire water	6" line
Telephone	4 lines
Sanitary sewer	8" line
Parking spaces	Unloading area for one tour bus; 100 parking spaces

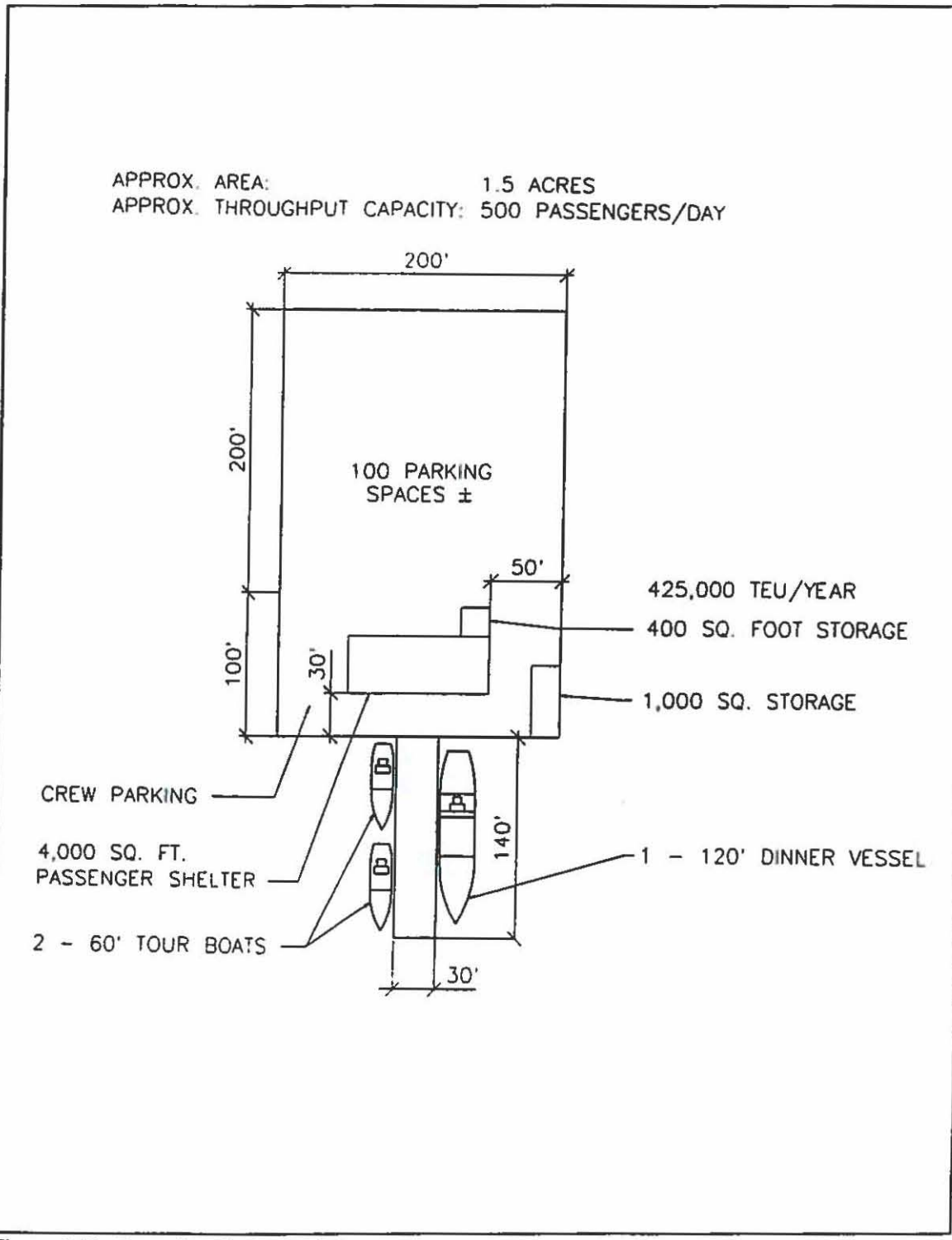


Figure 5.13 Excursion Cruise Module

5 Planning Considerations

Efficient operation is important since excursion cruise passengers tend not to spend time waiting at the site. The module achieves efficiency through allotting ample space for drop-off and pick-up areas on the wharf apron.

- Dimensions: 200' x 300'
- Throughput: 500 passengers daily

The module design is guided, in part, by the typical vessels which run the excursions:

- Dining vessel: 120 passengers @ 3 trips per day = 360 passengers
- Tour boat: 80 passengers @ 6 trips per day = 480 passengers

If all filled, per day capacity: = 840 passengers

Assuming the excursions would achieve 60% occupancy, 500 passengers would pass through daily. If the terminal operates for 200 days/year. The yearly throughput would reach about 100,000 passengers.

This module will satisfy the throughput needs of a very busy excursion cruise industry. Some of the main terminal components which are used to accommodate a thriving excursion cruise operation include:

- Flexible berths with several Ballasts to accommodate various sized vessels.
- Portable Gangways which can maneuver according to the size of the vessel.
- One passenger terminal lounge to provide cover for passengers and serve as an informal office for ticketing and information.
- One 1,000 storage room to be used for miscellaneous needs.
- A bus loading and unloading area large enough for a large tour bus to turnaround.

Various excursion cruise terminals were used to design create this module. The terminal is designed to operate daily during the peak season when the wharf and facility is expected to be constantly in use. The throughput could range from 1,000 to 2000 passengers a day.

5.4.9 Fishery Module

The terminal berth length of the fishery module at Figure 5.14 is approximately 600 feet. The accessible backland is approximately 530 - 600 feet which proceeds from the wharf to the road that separates the site space from the interior wetlands. The total fishery area is approximately 7 acres. The main facilities are located near the berth, while the storage and open work areas are located at the sides and farther into the backland of the module. Principal infrastructure requirements are listed in Table 5.9. Notional building requirements are listed in Table 5.10.

The two processing and warehouse buildings are the center of the entire module. Each building will include processing bays and warehouse space on the wharf apron side. At the interior side of the buildings, packaging and shipping facilities are provided to prepare the fish for quick transfer to the airport and on to the markets abroad. The ice and salt plant works are located at the back of the two major buildings. This will give the entire fishing fleet equal access to those facilities, access they might not have otherwise if such support operations were confined to exist under one roof.

During the peak fishing season, vessels will dock 4 to 6 deep at a berth to unload their catches, which saves money and increases the use of the space. Since this stacking practice can produce a chaotic atmosphere to unload and process the fish, the processing bays should be located as close to the berths as possible. Between the vessels and the processing bays, a wharf apron is provided to facilitate the space intensive fish unloading operations.

Some of the major elements illustrated in the terminal are:

- The apron is approximately 30 feet wide the entire length of the wharf. The current wharf apron at the commercial port are approximately 50 feet and the additional space will increase efficiency and long term productive.

- The module provides fish bays of between 40 feet and 50 feet wide. The varying bay sizes are intended to accommodate the differing sizes of companies.

- The ice and salt support operations are located at the back of the building (backland side of the site) since this is the closest point between the processing bays and the truck pick-ups.

- The trucks have access to the truck bays at the backside of the warehouse. To facilitate this part of the operation, a roadway of approximately of 75–100 feet should be maintained which leads around the back of the buildings.

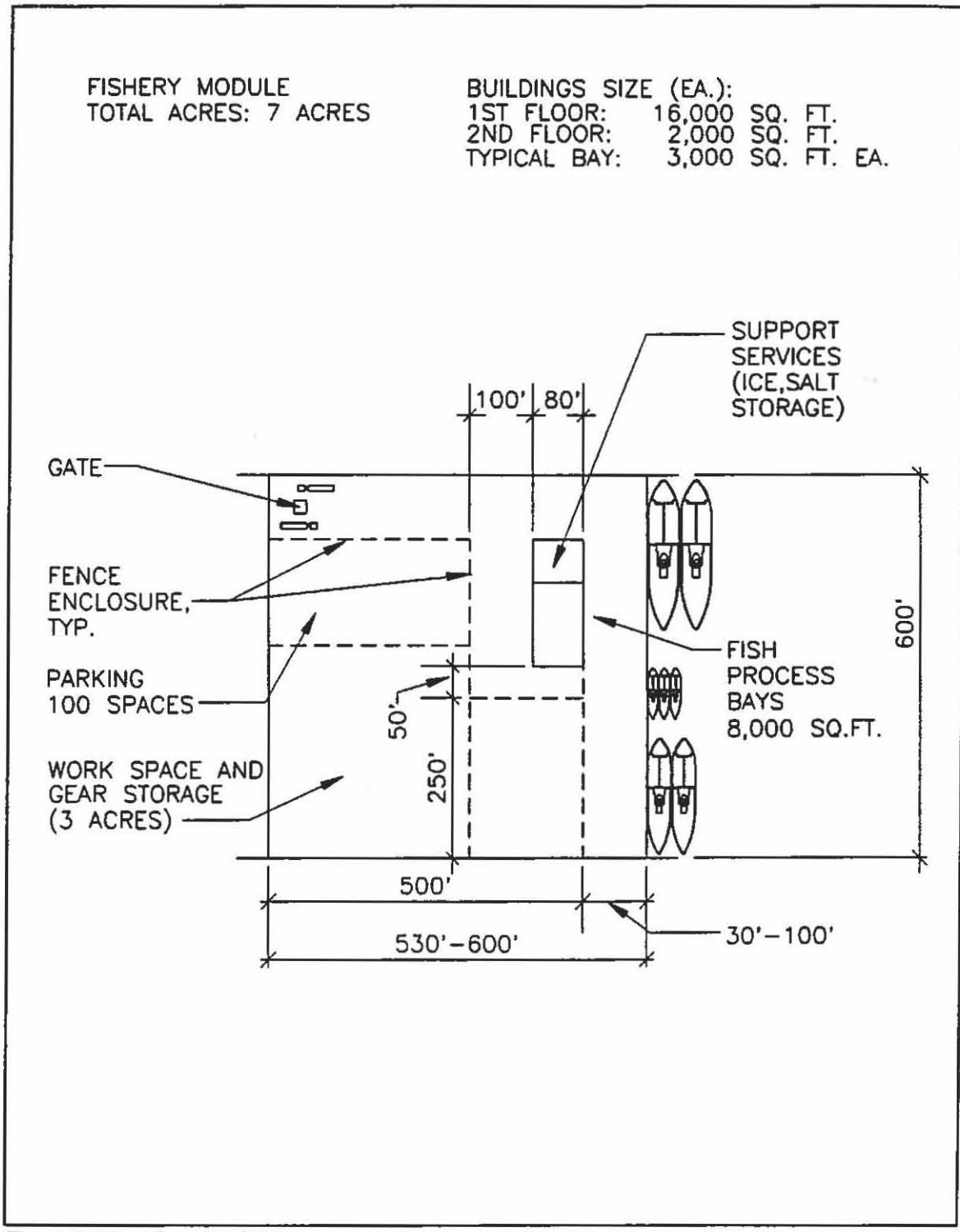


Figure 5.14 Fishery Module

The remaining terminal area will accommodate open area repair and gear storage. Since vessel and fishing gear is the most important factor to any operating fishing industry, the storage should be conveniently located near the end of the wharf apron and extend back into the rest of the site. This will enable companies to repair or maintain gear at a closer locale than if it were located farther back into the backland.

Table 5.9
Fishery Terminal
Infrastructure Requirements

Total Area	7.3 acres
Throughput capacity	Approximately 100,000 metric tons per year
Building area	18,000 square feet
Parking spaces	100 spaces (1 acres)
Electric power	3,000 KVA
Lighting	2,500 KVA
Building	500 KVA
Potable water	180 gpm
Fire water	8" line
Telephone	10 lines
Sanitary sewer	10" line
Storm sewer	2 x 24" outfalls
Special utilities	Paging
Special building	Customs and Security office; Fishermen Association

In the fisherman building, above the fish processing facilities, office space will be available for company use. From this vantage point the employers can overlook their operation and will have more space to work without the potentially distracting commercial port operations to interfere. Because these offices tend to be relatively small, only half of the second floor will be occupied by the offices. The rest can be used for company and/or crew facilities.

Table 5.10
Fishery Terminal, Building Requirements

Processing space	2,000 - 10,000 square feet
Warehouse	3,000 - 8,000 square feet
Cold Storage	1,000 - 3,000 square feet
Offices	1,000 - 1,500 square feet
Parking	10 - 15 spaces
Dock fence	100 300'
Dock	20' - 30' wide
Ice plant	

GP
ASSOCIATES, INC.
Engineers/Architects

Reuse of NAVACTS Areas

6

6 Reuse of NAVACTS Areas

NAVACTS areas under consideration for redevelopment consist of two distinct areas: (1) Victor Wharf in Inner Apra Harbor, and (2) Drum Lot at Polaris Point. This section discusses long- and short-range redevelopment alternatives for these two areas.

6.1 Victor Wharf

Victor Wharf is an existing wharf structure located in the southwestern portion of Inner Apra Harbor. The entire wharf is approximately 3,465 feet long. Although there were some minor damages to the wharf as a result of the August 1993, 8.1 Richter Scale earthquake, visual inspections shows that the current condition of Victor Wharf appears to be adequate. Currently, the wharf—which is divided into approximately seven berths—is used by the U.S. Navy and the U.S. Coast Guard in the following manner:

Victor - 1,2	NAVACTS	Approximately 965 feet
Victor - 3.5	NAVACTS/Coast Guard	Approximately 400 feet
Victor - 3	Coast Guard	Approximately 400 feet
Victor - 4, 5, 6	NAVACTS	Approximately 1,700 feet

6.1.1 Long-Term Reuse

Using the facility modules discussed earlier, suitable configurations and sites were identified throughout Apra Harbor to accommodate these port terminals. (Please refer to Section 5.4, Planning Using Facility Modules, for a discussion of how these modules were used in the planning process.) Based on site characteristics and module requirements, Victor wharf appears to be suitable for five different functional reuses. The potential uses are Fishery Facility, Containerized Cargo, Break Bulk, Passenger Cruise, and Warehouse operations. A sixth use is by the U.S. Coast Guard. Although the Coast Guard will remain in its present location—in the approximate center of the wharf area—other functions can be readily performed without interfering with or being interfered by Coast Guard Operations. Figure 6.1 shows existing structures in the Victor Wharf area as well as potential new structures and long-term functional use alternatives.

6 Reuse of NAVACTS Areas

The "potential cost" estimates associated with each possible use are high end cost estimates to build state-of-the-art facilities. However, since many of the areas under consideration have reusable existing infrastructure, state-of-the-art facilities are not necessary. Consequently, "realistic budget" ranges are provided for each use at each site. The ranges represent the cost estimated to customize terminals to satisfy Guam's current needs and future growth, both with minimum and medium budgets. Detailed printouts of each estimate are provided in Appendix D of this report.

6.1.1.1 Southern Berths. The berths at the southern end of the Victor wharf are in good condition. Recent repairs have been performed including fender replacement and new pavement. Therefore, it is possible to develop the following terminals:

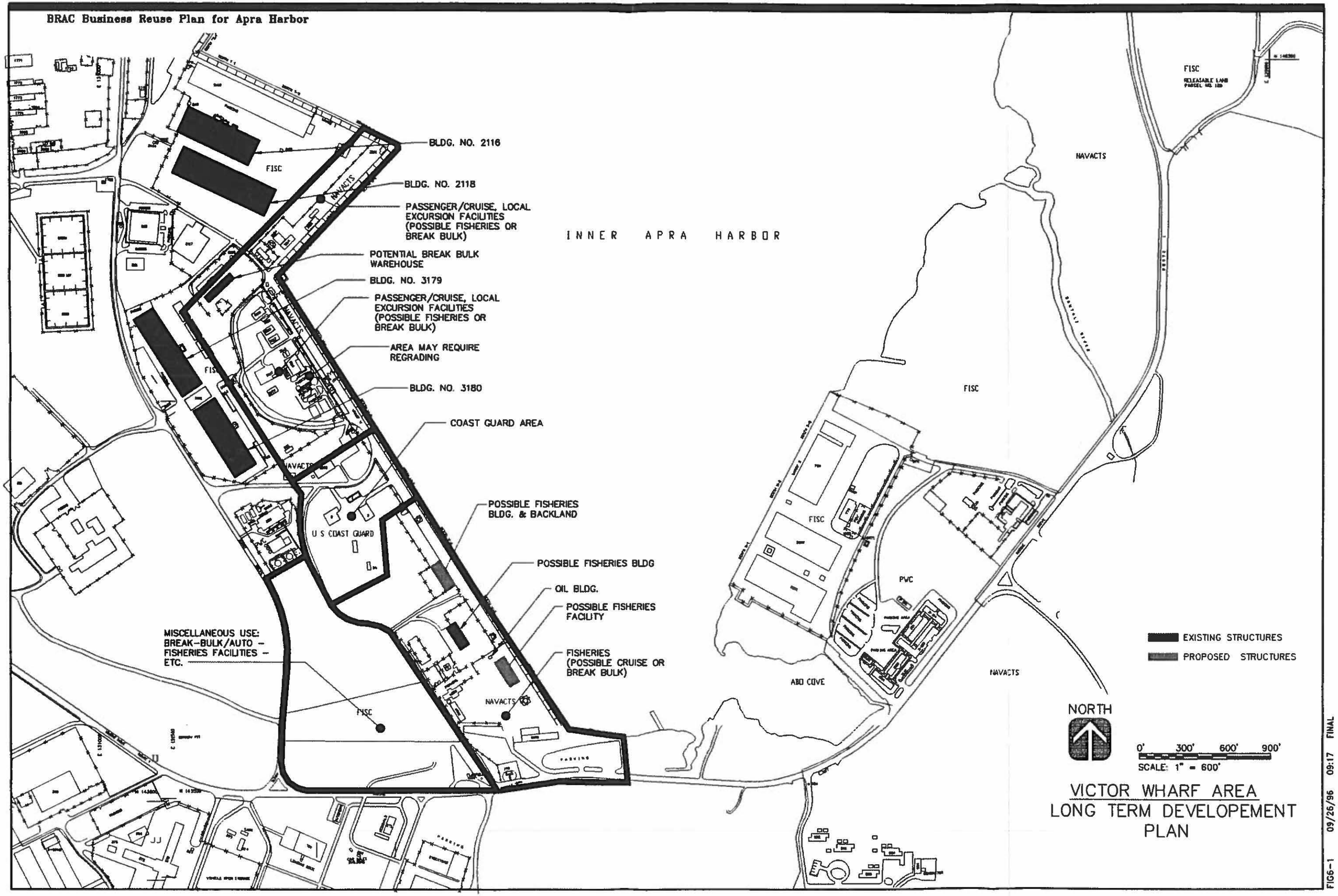
Fishery Facility. Victor wharf offers an excellent long-term location for fisheries activities. Adequate water depth, good access, and space for backland and support structures enhance the value of using portions of Victor wharf for fisheries. The southern Victor Wharf berths can satisfactorily accommodate a fishery terminal. The approximate acreage of on Fishery module is 7 acres, 600 feet long and 600 feet into the backland. Two modules are envisioned at Victor Wharf South, for a total of 14 acres. The use of this area for fisheries activities would probably require building construction since there is not a building within 30-100 feet of the wharf. However, the existing NAVACTS buildings numbered 6000 and/or 6009 could be used for fisheries activities in the short term.

Potential Cost:	$4,300,000[1]
Realistic Budget Range:	$1,290,000 to $2,580,000

Key New Cost
Fishery Facility (2)
Minor Infrastructure

Break Bulk. Break Bulk vessels can generally navigate the relatively shallow waters within Inner Apra Harbor and the Victor Wharf area. Hence, new development should be considered for this function. Several of the existing buildings that are adjacent to Victor Wharf could be used for the covered storage and to meet warehousing requirements of selected break bulk cargoes. Adequate open storage is also available in

[1] Additional details on estimated prices for programmatic cost estimates related to Victor Wharf are provided in Appendix D.


BLDG. NO. 2116
BLDG. NO. 2118
PASSENGER/CRUISE, LOCAL EXCURSION FACILITIES (POSSIBLE FISHERIES OR BREAK BULK)
POTENTIAL BREAK BULK WAREHOUSE
BLDG. NO. 3179
PASSENGER/CRUISE, LOCAL EXCURSION FACILITIES (POSSIBLE FISHERIES OR BREAK BULK)
AREA MAY REQUIRE REGRADING
BLDG. NO. 3180
COAST GUARD AREA
POSSIBLE FISHERIES BLDG. & BACKLAND
POSSIBLE FISHERIES BLDG
OIL BLDG.
POSSIBLE FISHERIES FACILITY
FISHERIES (POSSIBLE CRUISE OR BREAK BULK)
MISCELLANEOUS USE: BREAK-BULK/AUTO - FISHERIES FACILITIES - ETC.
INNER APRA HARBOR
FISC
NAVACTS
U S COAST GUARD
PVC
ABO COVE
EXISTING STRUCTURES
PROPOSED STRUCTURES
NORTH
0' 300' 600' 900'
SCALE: 1" = 600'
VICTOR WHARF AREA
LONG TERM DEVELOPEMENT PLAN
FIG6-1 09/26/96 09:17 FINAL

several of the adjacent undeveloped or paved areas adjacent to Victor Wharf. Access to the Victor Wharf area is excellent for truck movements in and out of the facility, as well as to nearly commercial trade zones.

10 acre Break Bulk terminal can also be located at this site. The backland is adequate and the wharf appears to be in good condition. However, the area may require a more durable pavement. In addition, the area may require construction of a substantial storage facility of, say 90,000 square feet.

Potential Cost:	$6,900,000
Realistic Budget Range:	$1,380,000 to $3,450,000

Key New Cost
Warehouse
Asphaltic Pavement

Passenger Cruise. The potential to use Victor Wharf for passenger facilities is enhanced by the excellent road access to the area and the availability of a wharf apron that is adequate for bus and taxi service. Passenger cruise operations in Guam may only require 300 feet of backland to accommodate a terminal building. The southern berths offer a more than suitable site since there are only a few existing structures. This will enable easy construction of a new terminal building.

Potential Cost:	$14,200,000
Realistic Budget Range:	$2,840,000 to $8,520,000

Key New Cost
Terminal Building
Major Infrastructure

Containerized Cargo. Although it is possible for a container terminal to develop at the southern end of the Victor Wharf, expansion limitations should be considered. Because a typical container terminal is approximately 82 acres, with a wharf length of 2,200 feet, creating another terminal at the south wharf may be difficult. The entire wharf might only accommodate one terminal, leaving little room for expansion. For costing purposes, we have assumed a 60 acre terminal at the south wharf.

Potential Cost:	$15,000,000
Realistic Budget Range	$4,500,000 to $10,500,000

Key New Cost
Asphaltic Concrete Pavement
Gate House Building
Maintenance and Repair Building
Major Infrastructure
Gantry Cranes (4)—not included in cost estimate

U.S. Coast Guard. The U.S. Coast Guard will remain in their present area in the southern portion of Victor Wharf. Their area includes 400 feet of wharfage, a headquarters, maintenance, and supply storage building adjacent to it, off-site housing, and related infrastructures to perform their missions. The continued presence of the Coast Guard at Victor Wharf will have a positive impact on maritime activities, not only in the vicinity of Victor Wharf and the Inner Harbor, but also in the waters in and about the territory.

6.1.1.2 Northern Berths. The northern part of Victor Wharf is in average to poor condition with respect to new development or redevelopment. There is a grade elevation 6 to 10 feet high and extends from the wharf approximately 100 feet. Additionally, there are some extensive pavement cracks at the far northern section and the wharf fenders are not in the best condition. For these reasons, uses that require flat land and adequate to good wharf conditions, will require substantial repair work.

Break Bulk/Auto. At the northern berths, the 600 feet of interior backland will easily accommodate the 10-acre Break Bulk module. It is possible that the Break Bulk facility could use existing building No. 3176 in the immediate future and later, the surrounding buildings 3179 and 3180. Each of these buildings is 97,200 square feet and could have 48,600 square feet of storage space. However, if these buildings are not transferred in the BRAC process (as of this writing, unlikely), a new storage shed may be constructed to operate at these berths.

6 Reuse of NAVACTS Areas

Potential Cost:	$8,600,000
Realistic Budget Range:	$1,720,000 to $4,300,000

Key New Cost
Warehouse
Earthwork, Grading, Paving

Warehousing. The current list of properties to be released by the Navy does not include the five warehouses adjacent to or near Victor Wharf (at either Uniform or Tango wharves). These buildings are numbered 2116, 2118, 3169, 3179, and 3180. The buildings offer a total square footage area of approximately 547,400 square feet. Despite this fact, the area is still an optimal space for a warehousing service center. The more than 18 acres of land could easily accommodate several new warehouse facilities.

Potential Cost:	$8,800,000
Realistic Budget Range:	$2,640,000 to $4,400,000

Key New Cost
Warehouse
Earthwork, Grading, and Paving

Since the BRAC process will continue well into the future, it is possible that part or all of the warehouses will be turned over to Guam. This would result in the northern part of the Victor Wharf being an expansive warehousing terminal with minimal modifications. The area would include the two closest warehouses, buildings No. 3179 and No. 3180. If the facilities are not transferred, the land area at the northern section of Victor wharf is large enough to support the construction of new warehouses. New structures might be necessary since the current reuse footprint does not include the two aforementioned buildings which have 92,700 square feet each.

Containerized Cargo. As in the case of the southern Victor Wharf berths, a containerized cargo terminal at this site may face expansion limitations. There are more existing structures in the vicinity of the northern berths than the southern wharfs which may require demolition. In addition, substantial earthwork and grading may be required to create a level and durable working surface. For costing purposes, we have assumed a 30 acre terminal at the northern wharf.

Potential Cost:	$12,000,000
Realistic Budget Range:	$3,600,000 to $8,400,000

Key New Cost
Earthwork, Grading, Concrete Pavement
Gate House Building
Maintenance and Repair Building
Major Infrastructure
Gantry Cranes (4)—not included in cost estimate

Fishery Facilities. Two Fishery modules can be satisfactorily developed at the northern berths with enough surplus space to accommodate another function. The modules will comprise approximately 14 acres with a wharf length of approximately 600 feet each. Since the northern berths comprise 1,350 feet, the fishery could be located easily at this site. The site may require two modules which would provide approximately 36,000 square feet of building area.

Potential Cost:	$6,700,000
Realistic Budget Range:	$2,010,000 to $4,020,000

Key New Cost
Fishery Modules (2)
Minor Earthwork and Pavement
Minor Infrastructure

Passenger/Cruise. The passenger cruise operations may require only 300 feet of backland to accommodate a terminal building. however, because of the small hill at this site, the terminal building location can be modified. Hence, the adjacent Uniform Wharf may be better suited for this use. The terminal will require a terminal building and parking space.

Potential Cost:	$15,500,000
Realistic Budget Range:	$3,100,000 to $9,300,000

Key New Cost
Terminal Building
Major Infrastructure
Pavement and Landscaping

Although all of these uses could be located at Victor Wharf, some of the uses are better suited than others. For example, because of the Inner Harbor's shallow channel and berths, the smaller fishing vessels may be much more appropriate for using Victor Wharf than the large container vessels. In addition, there is an immediate need for an expanded or relocated fishing terminal due to the crowded conditions in the existing commercial port area. Hence, it makes prudent sense to plan on at least a portion of Victor Wharf being permanently set aside to support Guam's fishing industry.

6.1.2 Short-Term Reuse

Victor Wharf is immediately available and useful for commercial redevelopment. This section will focus on a short- to intermediate-term phased plan to redevelop the wharf area upon finalization of leasing arrangements with the Navy.

6.1.2.1 Possible Options for Short Term Reuse. Several of the possible short term reuse options for the Victor Wharf Area are similar in nature to long-term reuses. The options are discussed in the following paragraphs in the form of two alternatives and a final recommended short-term reuse plan. Each alternative considered the most practical uses of the Victor Wharf Area with an emphasis on the most effective use of the existing available resources. The two alternatives were then evaluated and used to determine the recommended reuse plan for the Victor Wharf Area. Prudent planning dictates that significant developments for short-term reuses not be undertaken in areas that are not compatible with long-term plans for the area. In fact, long-term reuses should drive the decision making process for short term reuse. Capital expenditures for major infrastructures should be spent on facilities that are not likely to be relocated at some later date. Based on this criteria the following types of facilities have been identified for the possible short-term reuse of Victor Wharf.

- Passenger/Cruise Facilities
- Fisheries Facilities

- Break-Bulk/Autos Facilities
- U.S. Coast Guard

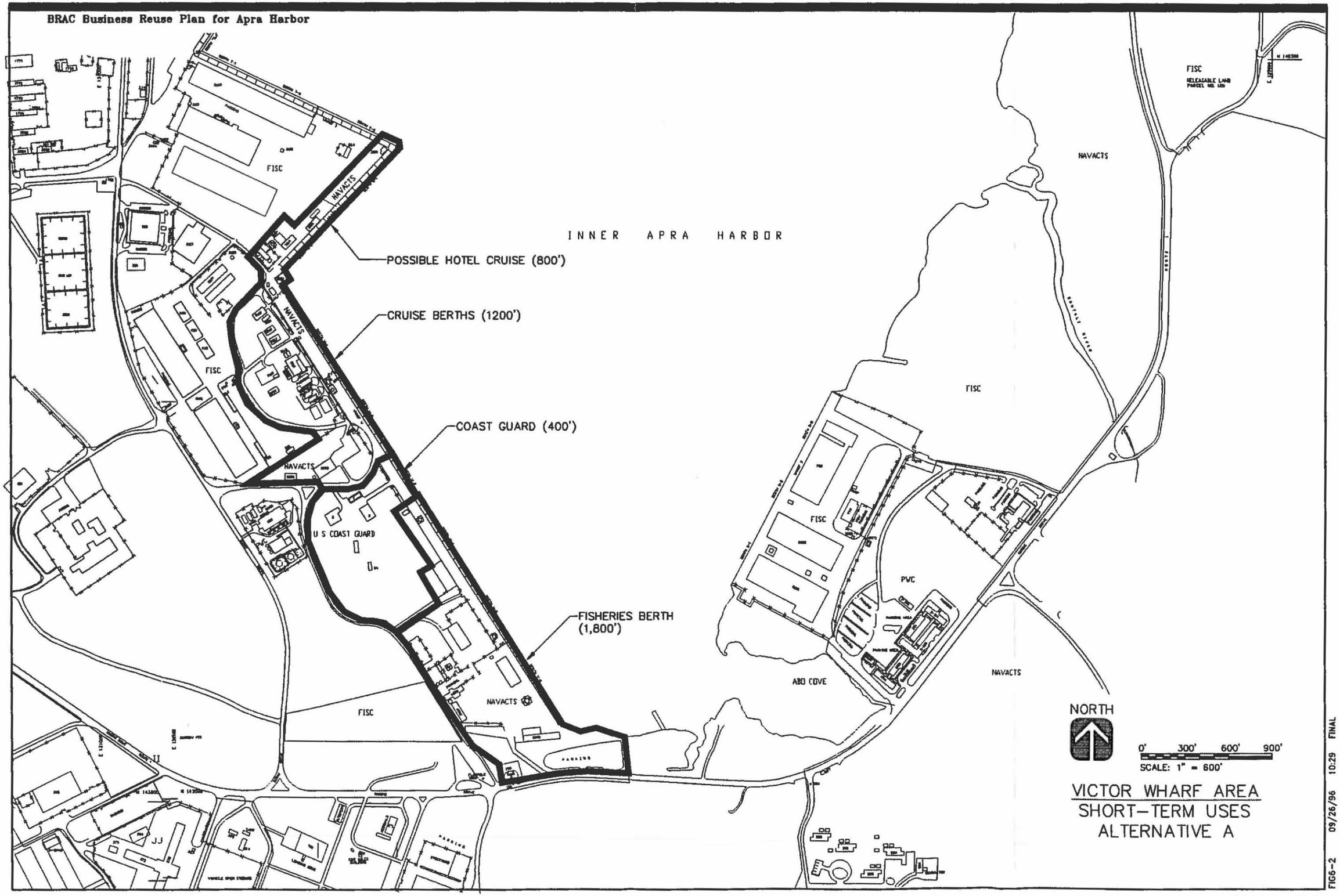
6.1.2.2 Discussion of Possible Options. The following is a brief discussion of the two alternatives, designated Alternative A and Alternative B:

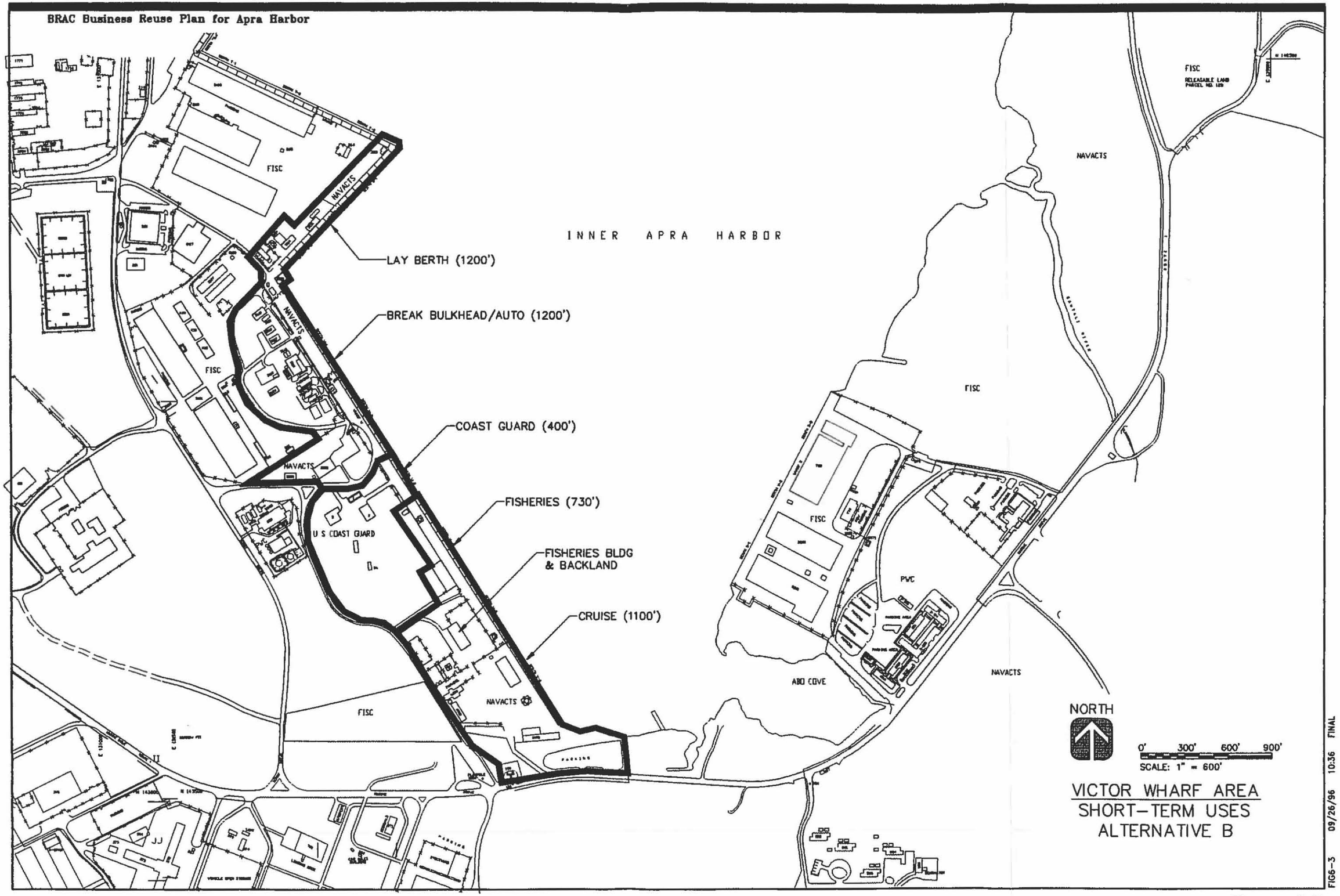
Alternative A. This alternative, shown at Figure 6.2, provides Fisheries Facilities along the southern portion of Victor Wharf. A 1,800-foot long section of the existing wharf would be used for the Fisheries Facilities. As previously discussed in Section 5, there is ample room for a new fisheries support building in the backlands of the wharf. The Coast Guard would remain in its present location, and would continue to use a 400 foot long section of the existing wharf. The large open area which is located approximately 900 feet west of the Victor Wharf-South area, designated for Miscellaneous Uses, could be used in the future for storage of autos or break-bulk products, or to meet fisheries or cruise/passenger overflow needs[2].

A Cruise/Passenger Facility is located along the northern portion of Victor Wharf, occupying approximately 1,200 feet of the wharf. In addition, a possible Hotel Cruise Facility has been positioned along the existing Uniform Wharf, occupying approximately 800 feet of the wharf.

Alternative B. This alternative, which is presented in Figure 6.3, provides Cruise/Passenger and Fisheries Facilities along the southern portion of Victor Wharf. An 1,100-foot long section of the existing wharf would be used for Cruise/Passenger facility functions and a 730 foot long section of the existing wharf would be used for a Fisheries Facility. An existing building located adjacent to Victor Wharf-South, (identified as Building No. 6009, see Appendix F) which is approximately 15,300 square feet , would be utilized for the Fisheries Building. The Coast Guard would remain in its present location, and would continue to utilize a 400 foot long section of the existing wharf.

[2] The Navy has indicated that this area is available for long-term leases, but not deed transfer. According to the Navy, the area has not been actively used since the World War II period, and has never been properly demilitarized. There are no plans to perform an extensive environmental clean-up due to shortage of funds.


INNER APRA HARBOR
POSSIBLE HOTEL CRUISE (800')
CRUISE BERTHS (1200')
COAST GUARD (400')
FISHERIES BERTH (1,800')
FISC
NAVACTS
U S COAST GUARD
PWC
ABO COVE
NORTH
0' 300' 600' 900'
SCALE: 1" = 600'
VICTOR WHARF AREA
SHORT-TERM USES
ALTERNATIVE A
FIG6-2 09/26/96 10:29 FINAL


INNER APRA HARBOR
LAY BERTH (1200')
BREAK BULKHEAD/AUTO (1200')
COAST GUARD (400')
FISHERIES (730')
FISHERIES BLDG & BACKLAND
CRUISE (1100')
FISC
NAVACTS
U S COAST GUARD
ABO COVE
PWC
NORTH
0' 300' 600' 900'
SCALE: 1" = 600'
VICTOR WHARF AREA
SHORT-TERM USES
ALTERNATIVE B
FIG6-3 09/26/96 10:36 FINAL

6 Reuse of NAVACTS Areas

A Break-Bulk/Auto Terminal is provided along the northern portion of Victor Wharf, a 1,200-foot long section of the wharf being used for this operation(s). In addition, a possible Lay Berth has been identified along Uniform Wharf approximately 1,200 feet in length. The area could also be used for occasional cruise ship berthing.

Description of Facilities for Short Term Reuse at the Victor Wharf Area. The following paragraphs describe the intended types of short term reuses that are being proposed for the Victor Wharf Area:

- *Passenger/Cruise Facilities and Break-Bulk Terminals.* The existing Victor Wharf appears to be adequate to support some passenger/cruise facilities. These passenger/cruise facilities are assumed to be port-of-call types of facilities—also referred to as in-transit terminals—which would utilize the smaller class of cruise vessels. Port-of-call terminals are generally a stop-over for cruise vessels which allow passengers to go ashore and sample the local culture, shop, enjoy the local beaches, golf, and participate in similar tourist-oriented activities. These cruise vessels tend to be cyclical in nature, originate from other ports, and arrive mostly on week days. Therefore, berth utilization is generally low. The low berth utilization thus offers opportunities for the shared use of the berths and facilities. Generally a 15,000-20,000 square foot building adjacent to the wharf is required to handle passenger disembarkation, local customs, and immigration checks. A local tour bus/taxi loading area is also required as well as minimum parking for employees. However, there are currently no existing buildings immediately adjacent to Victor Wharf that meet this criteria. A new structure would therefore be desirable for use as a long-term cruise facility. However, a temporary structure could be used in the short-term. Because this facility has low berth utilization, it could also be shared with a break-bulk terminal. However, because a break-bulk terminal often requires a covered storage area or warehouse with approximately 50,000-90,000 square feet of storage space, a larger adjacent building would need to be constructed, or one of the existing buildings be designated for reuse.

- *Local Excursion Facilities.* The potential for local excursion cruises, including dinner and dance cruises, and local day time cruises represents another feasible market for some new development at Victor Wharf. This type of operation can often share berths. Local excursions, using larger vessels with capacities of up to 150 passengers, as well as smaller vessels with capacities of approximately 50 passengers, is already a very popular and growing service at the Commercial Port with visitors to Guam. Given its robust presence at the Commercial Port, this type of service could be expanded proportionate to the growing rate of tourism in Guam. Victor Wharf could lend itself to this potential expansion. The local

excursion facilities could conceivably be shared with either the passenger/cruise facility or the break-bulk terminal. Victor Wharf could offer a combination terminal which is capable of accommodating all of these uses. Local Excursion Facilities generally require a small office structure of approximately 1,000 square feet for passenger processing and direct access to a gangway for access to the vessels. While this type of typical facility may be standard in some regions of the world, the local practice of existing operations may dictate how new facilities are designed and utilized.

- *Fisheries Facilities.* Fisheries facilities could also be located within the Victor Wharf area for short term reuse. The existing channel criteria and basin geometry (dredged depths) are adequate to support most of the known shallow draft type of fishing vessels. The berths are more than capable of supporting fishery related activities such as loading and unloading operations. Such a facility should provide adequate mooring, fuel, ice, storage and fish processing areas. Adequate high-pressure water at the dock should also be provided for vessel and equipment washdown. The existing status of the water system at Victor Wharf is not known and could require upgrading to bring it up to standards. A wharf length of approximately 700-800 feet is generally required to support four 120-foot trawlers, but smaller, and therefore more vessels could also be accommodated.

  For the long-term, a fisheries support building (or buildings) should be planned. This would include storage bays and support areas. The existing Victor Wharf does offer some existing structures that could serve for use as storage facilities, but they are not immediately adjacent to the existing wharf. However, this is not considered to be a major obstacle. Additional amenities such as a small office area, showers, and laundry, as well as a lounge area, should be included in the design of these facilities. Unlike cargo or passenger terminals, fisheries facilities are usually at least partially occupied and are active on a daily basis.

- *U.S. Coast Guard.* The existing Coast Guard facilities should remain in approximately their present location. About 400 feet of the existing Victor Wharf should be earmarked for continued Coast Guard use.

Impacts of Short-Term Use on Long-Term Use. The impacts of short-term reuses on any long-term permanent reuses for the types of facilities described above are considered to be minimal. No new major infrastructure such as wharves or utilities are considered necessary. However, for the medium- to long-term condition, some new infrastructure such as buildings and paved parking areas may be required to support some of the recommended reuses. These would not necessarily be required in the

short-term condition. In addition, some of the existing utilities may require upgrades or improvements and the possibility exists for some new utilities such as high pressure water for the fishery facilities. Finally, minor impacts may be experienced with potential increases in local traffic due to the reuse of the existing facilities.

Benefits of Short-Term Use. Some of the possible benefits of the short-term reuse of Victor Wharf for passenger/cruise facilities, local excursion facilities and break-bulk terminals include the following:

- Potential for shared berth use.
- Potential for shared building(s)
- Potential for additional private sector jobs such as bus/taxi drivers, clerks, maintenance personnel, janitors, customs personnel, etc.
- Potential for additional longshoreman and warehousing jobs
- Potential for additional truck driver jobs
- Potential for secondary (regional) job generation
- Effective use of existing resources
- Ability to convert back to U.S. Navy use if necessary.

Some of the benefits of the specific short-term reuse of Victor Wharf for Fisheries Facilities include:

- A potentially expanded fisheries facility from that currently available near the Commercial Port, which could provide more berths, storage, and better overall facilities
- Better access to the local highways and airport which could enhance the shipment of chilled tuna by air to Japan and other regions
- Better utilization of the existing commercial port in areas vacated by fisheries.

Some of the benefits of the specific short-term reuse of Victor Wharf for the U.S. Coast Guard include:

- The Coast Guard provides a necessary and valuable navigational service to mariners as well as the enforcement and security of Apra Harbor and Guam. The U.S. Coast Guard maintains a full-service communication center which is operated

24 hours a day and provides vital information about storm warnings and weather messages on various radio frequencies.

- Effective use of existing resources

Detriments of Short-Term Use. Detriments of the short-term reuse of Victor Wharf appear to be nominal and could include the following:

- Some increase in local truck traffic should be anticipated due to the increased use of the proposed berthing facilities for a break-bulk terminal
- Some increase in local passenger traffic (taxis) and buses should be anticipated due to the proposed use of Victor Wharf for passenger/cruise and local excursion facilities
- Some increases in local truck and passenger car traffic should be anticipated due to the increased use of the proposed berthing facilities for a fisheries facility
- No increases are anticipated for the existing U.S. Coast Guard to remain unless they plan a significant increase in personnel deployed on the base.

Adequacy of Existing Facilities and Equipment for Short-Term Use. Based on the available information about the existing facilities and limited visual inspection, the existing facilities such as buildings around Victor Wharf generally appear to be in good condition for short-term uses.

Based on available information for the existing equipment, and limited visual inspection, the existing equipment around Victor Wharf generally appear to be in satisfactory condition for short-term uses.

Adequacy of Utilities and Infrastructure for Short-Term Use.

- *Utilities.* At the time this study was conducted, Victor Wharf was reported to provide the following utilities and services:
  - Electrical Power
  - Potable Water

- Phone
- Steam (by use of a portable boiler)
- Fire Water Hookups
- Salt Water

The conditions and adequacy of these existing utilities have not been confirmed except as discussed in Appendix G. A more in-depth inspection and evaluation of the existing utilities may be advisable to identify each specific utility and its condition. Our conclusions assume the validity of the recommendations for repairs issued in a separate report dated August 1993 by the Pacific Division, Naval Facilities Engineering Command. Based on a visual overview made in June 1996, the repairs to the utility trenches, and all other related utility damage, etc., appear to have been substantially completed. In addition, it has been reported that fuel for Victor Wharf is available by barge. Fuel pipelines to Victor Wharf for vessels are not known to exist.

· *Existing Infrastructure.* Based on the available information, and a cursory visual inspection, the existing wharf infrastructures at Victor Wharf generally appear to be in good condition for short-term uses. Some assumptions have been made with regards to recommendations for repairs to the damaged areas which were made as a result of a separate report issued in August 1993 by the Pacific Division, Naval Facilities Engineering Command. Based on a visual overview made in June 1996, the repairs to the settled pavement, bulkhead, displacement, cracks in deadman anchors, and all other related damages appear to have been substantially completed. A thorough inspection and evaluation of the existing Victor Wharf Infrastructure should be performed as part of a separate study which can identify and verify what, if any structural damage may exist on the underwater structures.

6.1.2.3 Comparison of Possible Options. The following paragraphs evaluates the relative benefits and detriments of the Alternatives A and B:

Alternative A.

· *Pros*

- Adequate space for two hotel cruise ships

- Adequate space for passenger cruise activities
- Good access for buses, taxis and cars
- Large area for fisheries
- Good expansion capability.

- *Cons*

  - Uniform Wharf needs repair and may be unsuitable for hotel cruise
  - Longer road access required for buses and taxis to cruise area
  - Expensive 260,000 fisheries building. (However, this is not an issue for short term use.)
  - Navy SEALS vessels located at Victor Wharf - North may preclude use of wharf for short term purposes.

Alternative B.

- *Pros*

  - Excellent access conditions
  - Immediate cruise and fisheries access without going through existing main gate
  - Flexibility to allow for cruise, fisheries and break-bulk/auto/miscellaneous
  - Good expansion capability
  - Utilizes existing building for fisheries support (short-term)
  - Use of Uniform Wharf for lay berth may be acceptable even in current disrepair. (However, additional structural studies would be required.)

- *Cons*

  - Existing SEALS location on small hill may preclude use for break-bulk until after SEALS relocation
  - Fisheries and cruise sharing south wharf area results in smaller footprints for each than as in Alternative A

6 Reuse of NAVACTS Areas

Consideration of these issues leads to the conclusion that many of the characteristics of each Alternative should be allowed for in the short-term reuse condition. Fortunately, the basic geometry, configuration and condition of the available wharf and building infrastructure and backlands are compatible with the proposed uses. Furthermore, the proposed uses are well suited to provide the benefits intended by BRAC reuse criteria, for both the near-term and long-term conditions. Therefore, the recommended short term reuse plan for Victor Wharf described below is a flexible concept with the ability to implement beneficial uses immediately, and to grow into a successful long-term development.

6.1.2.4 Recommended Short-Term Reuse. The recommended short-term reuse for the Victor Wharf Area was developed after evaluating Alternatives A and B. Both alternatives make effective use of the existing facilities. Hence, the recommended plan is intended to allow mixing attributes of either alternative. The recommended plan meets key criteria that have been used for the purpose of this study including:

- Effective use of existing wharf
- Effective use of buildings (where applicable)
- Effective use of backlands area
- The flexibility to develop into appropriate long-term uses
- The ability to phase into the medium and long-term reuse needs
- The potential for the shared use of facilities
- Minimal requirements for improvements or upgrades
- Good vehicle and vessel access
- Could easily be made available for reuse purposes
- Retains the value-added services of the U. S. Coast Guard facility
- Provides the potential for added service related and skilled labor jobs

These criteria represent positive contributions to the local economy and to the local community. In addition, the efficient and effective use of existing facilities is essential to the successful implementation of the BRAC reuse program.

The short-term plan is expected to be executed in two phases in order to satisfy relocation considerations of existing Navy functions.

6 Reuse of NAVACTS Areas

Phase I. In the first phase, the Government of Guam leases the southern portion of Victor Wharf and develops its fishery facilities. Figure 6.4 graphically portrays the first phase. The essential elements of this phase are as described in Table 6.1.

Access to the south Victor Wharf fishery area is through a single gate at Marine Drive. The area is separated from adjacent Navy properties by the new GovGuam-constructed perimeter fencing.

Phase II. Phase II completes the leasing of the northern portion Victor Wharf and Uniform Wharf. Execution timing of this phase is dictated by Navy needs to construct replacement facilities for the SEALS and the need to repair Uniform Wharf of the damages caused by the August 1993 earthquake. Figure 6.5 graphically portrays the results of this phase. The northern and southern Victor Wharf areas of the Government of Guam are split by the Coast Guard Station, but adequate alternate access routes are provided to GovGuam. The Navy, prior to completion of this phase, constructs a new fence line and entry station as it consolidates its needs farther into the naval base.

Table 6.2 describes the tasks that must be completed.

6 Reuse of NAVACTS Areas

Table 6.1
Primary Considerations, Phase I Implementation

Task	Responsibility	NLT[1]
Relocate Exchange/Retail Warehouse (Toyland-Building 6000) [Relocate function and contents from the existing Toyland into the old commissary building or another location within NAVACTS until a new permanent facility is ready.]	Navy	Mar 97
Relocate Pass/ID Office (Building 6003) [Relocate Pass/ID function from building 6003 to the old Pass/ID office next to the existing Main Gate (Building 138) as a temporary location until a permanent new facility is constructed.]	Navy	Mar 97
Relocate General Warehouse/Bulk (Building 6009) [Relocate function and contents from building 6009 to another building within NAVACTS.]	Navy	Mar 97
Relocate Thrift Shop (Building 6002) [Relocate function and contents from building 6002 to another building within NAVACTS.]	Navy	Mar 97
Relocate Navy Police and Impound Lot [Relocate Navy Police and impound lot function from the area behind building 6003 to the old commissary building or another location, until the new permanent facility is constructed.]	Navy	Mar 97
Relocate Military Dogs Training Area [Relocate the function to Orote Point or another location within NAVACTS until the new permanent facility is constructed.]	Navy	Mar 97
South Victor Wharf Perimeter Fence/Sentry [Construct a perimeter fence with sentry booth at Marine Drive to control entry and exit from Victor Wharf South.]	GovGuam	Jun 97

[1] Not Later Than

6 Reuse of NAVACTS Areas

Table 6.2
Primary Considerations, Phase II Implementation

Task	Responsibility	NLT[1]
Relocate Temporary Pass/ID Office [Relocate the Pass/ID office from its temporary location at building 138 to a new permanent location within NAVACTS.]	Navy	Jun 2000
Relocate the SEALS [Relocate the SEALS from their existing compound to their new facilities at Romeo Wharf.]	Navy	Jun 2000
Relocate the Port Operations Office [Relocate the port operations functions to a new location in the vicinity of Tango Wharf.]	Navy	Sep 99
Relocate the Main Gate [Relocate the Main Gate to its new, permanent location.]	Navy	Jun 2000
Construct New Perimeter Fencing	Navy	Jun 2000
Vacate Uniform Wharf [Perform permanent repairs to earthquake damage.]	Navy	Sep 99

[1] Not Later Than

6.2 Drum Lot at Polaris Point

6.2.1 Long-Term Land Use

The draft land use plan for Guam, "I Tano'ta," has designated two zones for the Drum Lot area at Polaris Point. The abandoned hardstand area is zoned for Industrial/Port Facilities, while the environmentally sensitive wetlands, river, and shoreline along the northern boundary are zoned Conservation/Preservation. Both designations are appropriate for the site conditions.

The area zoned for Industrial/Port Facilities has the following characteristics:

- Level terrain that facilitates development
- Excellent access via Marine Drive

6 Reuse of NAVACTS Areas

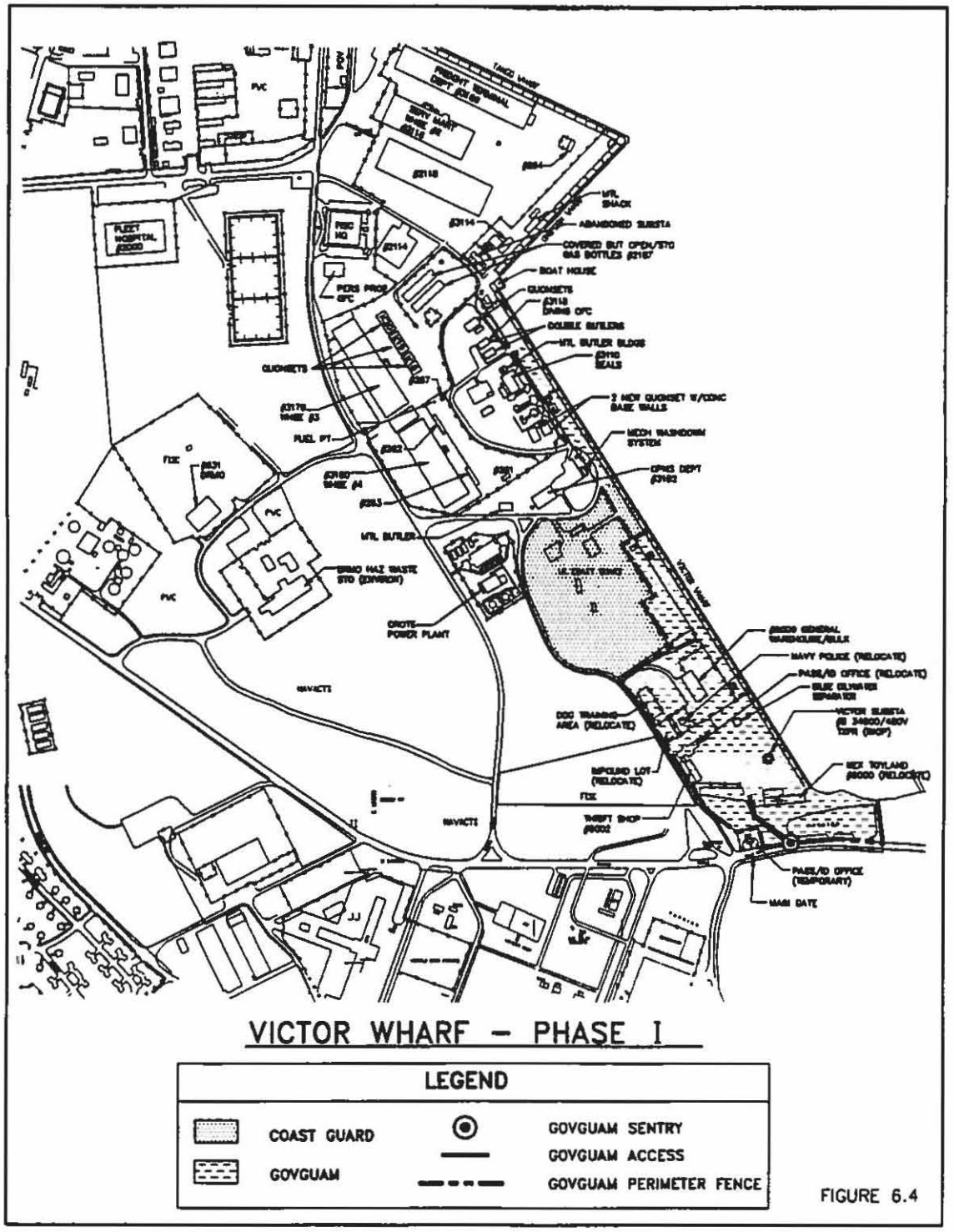


FIGURE 6.4

6 Reuse of NAVACTS Areas

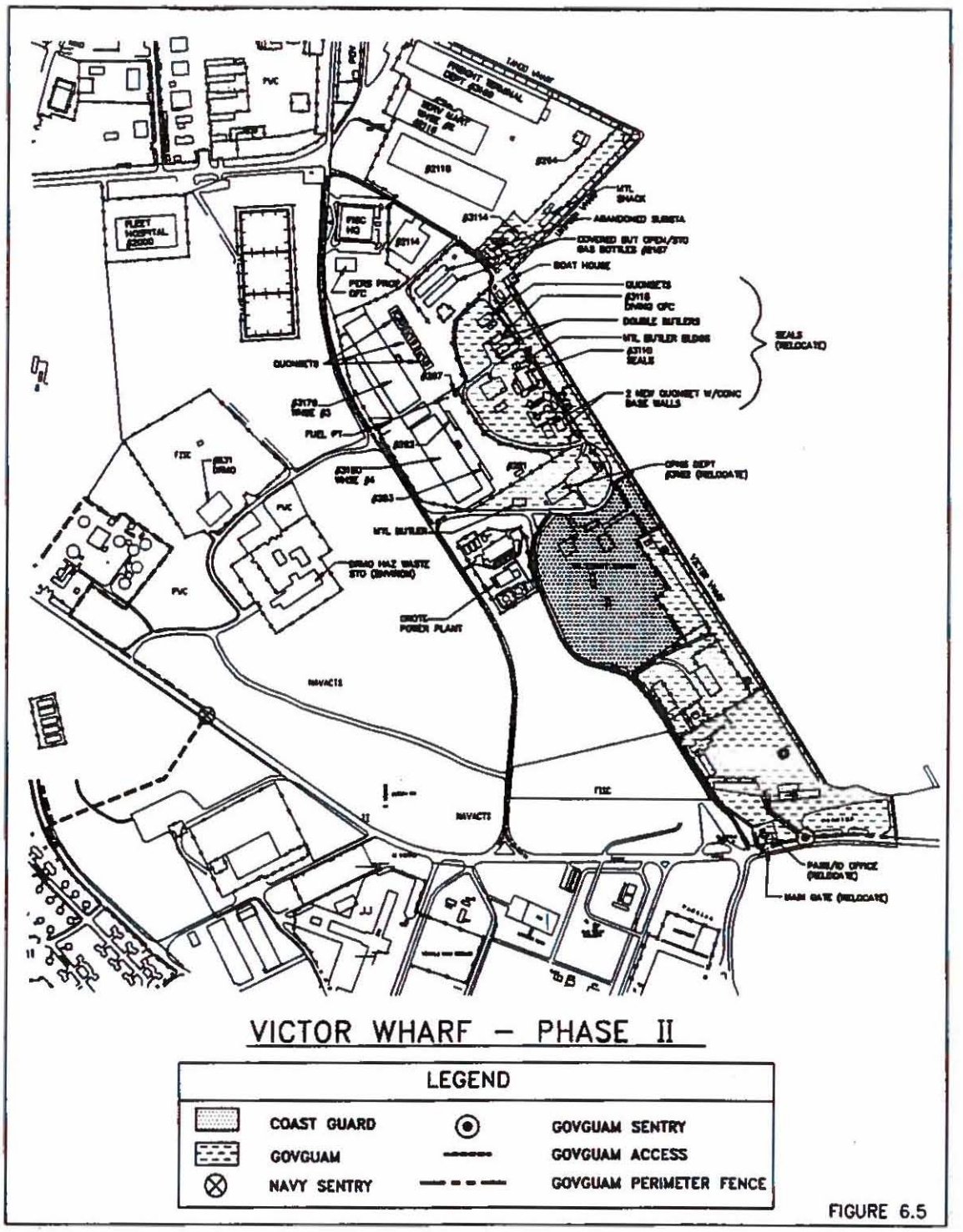


FIGURE 6.5

6 Reuse of NAVACTS Areas

- Adequate utilities to initiate development
- Low risk of conflict from an incompatible neighboring use since the site is buffered along the west (military) and north and south boundaries (conservation/preservation)
- Compatible with previous use

The site has certain possible disadvantages in that:

- Flood inundation zones require special construction or may constrain use
- Provides no access to Apra Harbor
- Soil conditions limit the building load or will require special construction techniques to be employed

I Tano'ta lists five broad use categories as follows:

- Manufacturing
- Wholesale/storage distribution
- Industrial services
- Public Utilities
- Support facilities for marine tourism and mariculture

The suggested uses under these categories are all suitable except those requiring harbor access such as boat repairs, marine pollution control facilities, marine supplies, and services. Likewise, uses such as incineration or power generation which generate significant air emissions are presently not permitted since the site lies within a zone of non-attainment. After this zone is changed to attainment, competition for emission increments will remain from existing power plants at Cabras Island and Apra Harbor.

While stormwater discharge management is a mandatory requirement, attention should be focused on protecting the conservation/preservation areas lying north and south from possible contamination from industrial activities.

Table 6.3 which lists the lot size, minimum setbacks, building height and building coverage has been reproduced from the I Tano'ta plan.

6 Reuse of NAVACTS Areas

6.2.2 Short-Term Reuse

The Drum Lot at Polaris Point could become immediately available and used for commercial or recreational purposes in the short term. This section describes possible short term uses and their impacts and benefits. Wetlands, the Aguada River, and an adjacent coral reef flat at the northern boundary make that portion best suited for conservation/preservation in both the short and long term. The action would set aside approximately 15 acres from the total parcel in a manner compatible with *The Land Use Plan for Guam*, I Tano'ta.

6.2.2.1 Possible Options for Short Term Reuse. Portions not set aside as conservation/preservation can be used for one of three possible uses: (1) open storage area, (2) open space recreation, and/or (3) a light industrial park.

Open Storage Area. An abandoned hardstand exceeding 25 acres can be used to store grounded and chassis mounted containers and new and privately owned vehicles in transit. This would require cleaning of overgrown brush, pavement repairs, security fencing, and outdoor lighting.

Open Recreation Facility. The site's level topography makes it adaptable for sports playing fields such as soccer, baseball, or a golf driving range. The required improvements consists of clearing of overgrown brush, removing pavement, and grassing of sport fields. Amenities such as restrooms, scoreboard, and bleachers would also be desirable.

Light Industrial Park. The third option is to start an industrial park by leasing building sites. Prospective tenants would be engaged in light manufacturing and warehousing. To date, the Local Reuse Authority (LRA) has reviewed expressions of interest from businesses involved in (1) warehousing—both dry and cold storage, (2) furniture production, and (3) fabrication of plastic home building products. Generally, tenants are expected to construct one- to two-story prefabricated buildings on two acre lots. Building size would vary from twenty to forty thousand square feet. Since retail and wholesale trade is anticipated, tenants would provide customer amenities such as showrooms, product displays, and parking. A well-planned industrial park would encourage complimentary businesses at the same location for customer convenience.

Table 6.3
Zoning District 8
Industrial/Port Facilities: Table of Dimensional and Density Requirements

Uses Permitted	Minimum Lot Size			Minimum Yard Setback (feet)			Max. Bldg. Height (feet)	Max. Lot Coverage (Percent)
	Area	Width (feet)	Depth (feet)	Front	Each Side	Rear		
Food Processing Facilities	2 Acres	200	200	50	25	25	50	35
Other Manufacturing Operations	1 Acre	100	200	25	25	25	35	25
Warehousing & Distribution Facilities	1 Acre	100	200	25	25	0*	35	40
Wholesale Operations	1 Acre	100	200	25	25	25	35	25
Motor Freight Terminals	2 Acres	200	200	50	25	25	35	30
Automobile Repair Facilities (minor, major paint, and body shops)	20,000 sf	100	100	25	25	25	25	25
Automobile Service Stations	20,000 sf	100	100	25	25	25	25	25
Marine Repair Services	1 Acre	100	100	25	25	0*	45	50
Harbor and Marine Supplies and Services	20,000 sf	100	100	25	25	25	30	35
Marine Industrial Fabricating Facilities	2 Acres	200	200	50	25	0*	35	25
Boat Repair Yards	1 Acre	100	200	25	25	0*	35	35
Boat Storage Facilities	2 Acres	200	200	25	25	0*	50	50
Seafood Processing/Packaging Facilities	2 Acres	200	200	50	25	0*	50	35
Marine Construction & Salvage Facilities	2 Acres	200	200	50	25	0*	50	35
Marine Pollution Control Facilities	2 Acres	200	200	50	25	0*	35	35
Quarrying/Mining Operations	5 Acres	300	500	100	25	100	35	5
Solid Waste Disposal/Incineration Facilities	20 Acres	1,000	1,000	100	200	500	50	5
Tour Bus Overnight Storage Maint. Facilities	2 Acres	200	200	50	25	25	35	20

* A minimum setback of five (5) feet from the edge of any pier, wharf, or bulkhead shall be required for any structure. The setback area may be utilized for activities related to the permitted uses, but shall not be used for off-street parking. The edge of any pier, wharf, or bulkhead shall include any attached apron(s).

As an example, the home building products sales can create similar trade in landscaping, equipment rentals, and interior furnishing and finishes.

The proximity to the Commercial Port, excellent access to Route 1 (Marine Drive) and the absence of adjacent residential areas or schools, support the industrial park concept. Also, the proposed construction is suitable for the existing soil conditions.

6.2.2.2 Discussion of Possible Options

Impacts of Short-Term Use on Long-Term Use. I Tano'ta specifies that the Drum Lot property, with the exception of the environmentally sensitive areas, be used to support industrial and port activities. This development objective would not be hindered by the open storage concept and is compatible with the industrial park concept. The open space recreation option could hinder further development as a result of public opposition to converting an existing public use area to private, commercial use.

Benefits of Short-Term Use. The open storage option benefits the Commercial Port in releasing more productive space at its container yard, and in providing an alternative site for temporary storage to shippers and other businesses at a likely lower cost. This option requires the least investment for improvements by the LRA—the storage area can be financed by user fees. This option allows the property to be converted to Navy use, if necessary.

The open space recreational option provides a positive benefit to the community while mitigating stormwater runoff with the increase in landscaped areas. This option will require a significant capital investment and continuing maintenance with no offset from income. These expenses could be financed by the general fund or the private sector through the adopt-a-park program. Conversion to U.S. Navy use remains possible under this option.

The industrial park concept provides the greatest economic stimulus in nurturing business and possibly export development, creating primary and secondary jobs, and generating tax revenues. Capital improvements are costlier with this option but can be financed by the tenants and lease rents. This option supports the long term land use objectives and can enhance existing environmental conditions of the site through stormwater management. The extent of improvements could restrict the U.S. Navy's reuse of the site.

6 Reuse of NAVACTS Areas

Detriments of Short-Term Reuse. The open storage concept is generally a passive use that does not enhance the site's existing environmental condition.

The open space recreational concept generates an added expense to the Government of Guam, as well as increased environmental restoration costs for the U.S. Navy. Recreational use is not compatible with long term land use goals. The site is not near the residential areas of Piti or Agat. The latter municipality will be better served by the recreational facilities at the Southern High School which is scheduled to open in August, 1997.

The industrial park will create more traffic along the Marine Drive corridor by virtue of its presumed business success.

Adequacy of Existing Facilities and Equipment for Short-Term Use. The Drum Lot area is sufficient to accommodate any of the proposed options. The one building and standpipes onsite have been abandoned, and are in disrepair.

Adequacy of Utilities and Infrastructure for Short-Term Use. The industrial park concept will generate the largest demand on utilities, while the open storage concept the least. The former will generate the following utility demands based on a model tenant with a two-acre site and a building footprint of 20,000 to 40,000 square feet.

Power	170 KVA
Water	10,000 gallons per day (125% of sewage)
Sewage	8,000 gallons per day (Public Utility Agency of Guam standards)

Adequate power can be supplied from the nearby lines on Marine Drive. Water is delivered to the site by a 12-inch line from a 24-inch transmission main on Marine Drive. An 8-inch distribution system was installed in the hardstand area for fire fighting purposes. The transmission and distribution systems are adequately sized to service the potable and fire fighting demands for tenants located within the abandoned hardstand perimeter.

Sewage generated by Navy activities at Polaris Point is collected at Pump Station Number 9 and transported to the Apra Harbor collection system via an 8-inch force main. This force main is aligned along the southern boundary of the Drum Lot. The

average sewage flow from this pump station has been measured to be 100,000 gpd[3] with the pump station and force main capacity being 1.1 million gallons per day. Hence, the existing facilities have adequate capacity to transport sewage from the proposed industrial park.

6.2.2.3 Comparison of Possible Options. The three short term reuse options are ranked as shown in Table 6.4, on the basis of five parameters as discussed below. Each parameter is assigned a positive, neutral, or negative value with regard to each reuse option. All parameters are equally weighted for purposes of this analysis.

Table 6.4
Ranking of Proposed Short Term Reuses
Drum Lot at Polaris Point

	Open Storage	Open Recreation	Industrial Park
Economic Stimulus	0	-	+
LRA Income	0	-	+
Environmental Condition	0	+	+
Long Term Compatibility	+	-	+
Adequacy of Utilities	+	+	+
Compatibility with Prior Use	+	-	+
Rank	**2**	**3**	**1**

- Economic stimulus measures the ability of the reuse option to create employment, generate tax revenue, and add to the territory's production.

[3] Figure 5.8, "Generalized Estimates of Flows by Sub-Tributaries," Utility Technical Study for Potable Water & Sanitary Sewer System.

6 Reuse of NAVACTS Areas

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[3] Figure 5.8, "Generalized Estimates of Flows by Sub-Tributaries," Utility Technical Study for Potable Water & Sanitary Sewer System.

- LRA Income is the net income after amortizing improvements. Open space recreation is assigned a negative value since there is no income and maintenance expenses are ongoing.

- Environmental Condition evaluations whether the site's existing condition will deteriorate=negative, remain unchanged=neutral, or improve=positive.

- Long Term compatibility compares the short term reuse to long term land use goals.

- Since existing utilities are adequate to implement the short term use, all proposals are judged positive.

- Open space recreational is assigned a negative value for compatibility with prior uses since environmental restoration is likely to be more rigorous in this case.

6.2.2.4 Recommended Short Term Reuse. The recommended short term reuse is to initiate the industrial park concept. It is also recommended that a planning study be commissioned to address the following items:

- Subdivision of lease sites
- Infrastructure needs in terms of sewer collection and lift stations, power, integrity of existing lines, and secondary access roads to lease sites
- Architectural and tenant use standards
- Lease income and amortization of improvements
- Common area expenses

It is further recommended that a study be conducted jointly by the Navy and the LRA to resolve the allocation of water and sewage treatment resources to the mutual benefit of both communities.[4] While the water and sewage utilities at or near the site are adequate for the recommended use, the Navy's ability to provide water and sewage treatment is finite.

[4] After reviewing the Interim Reuse Plan prepared earlier, the Navy has indicated its willingness to participate in a joint review, noting, however, that funding should be provided by the LRA.

GMP
ASSOCIATES, INC.
Engineers/Architects

Reuses for the SRF Area

7

7 Reuses for the SRF Area

This section describes options for converting the government-owned and operated Ship Repair Facility (SRF) into a commercial, privately-owned and operated facility that will maximize near-term and long-term benefits for Guam. Although exploring options for converting the facility into a viable private operation is the primary intent, non ship-repair alternatives are also discussed.

7.1 General Location

The SRF is located in a key position at the juncture of Inner and Outer Apra Harbors. Figure 7.1 is a general location map. (Please refer to Figure 2.3 in Section 2 for a more detailed view of the SRF area. The facility is bounded on the east and south by several wharves, and on the west by a road to the Explosive Ordnance Disposal (EOD) facility at the east side of Sumay Cove.

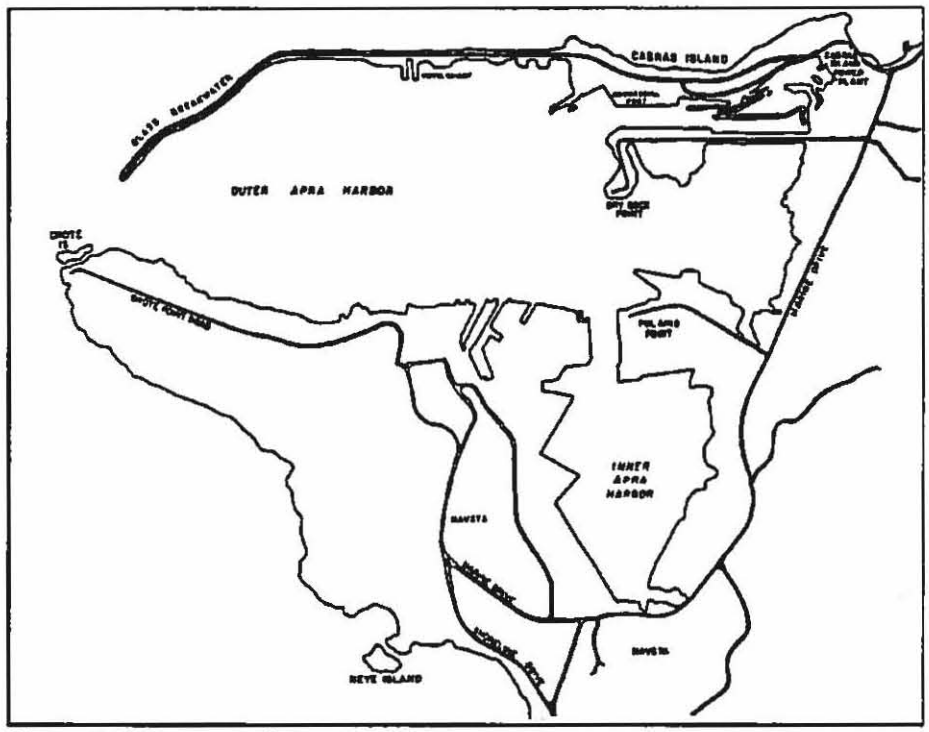

Figure 7.1 Inner and Outer Apra Harbors

7 Reuses for the SRF Area

7.2 Reuse as a Ship Repair/Light Industrial Facility

As an existing ship repair facility, the SRF is well-equipped and well-located for its function. The area has over 3,000 feet of operational wharf space, is equipped with two gantry cranes (although one appears to require repair), and two floating cranes. There is deep water—approximately 65 feet—on the northern edge of the facility. The area is ideal for continuing ship repair operations.

Because of these characteristics, it is likely that at least part of the area will continue to be used for ship repair work. If some the total available area is converted to another use, the most essential SRF buildings and equipment will remain for ship repair functions. The main costs associated with keeping the area an operational repair facility will be the upgrade and maintenance costs. Since the extent of ship repair activities may vary significantly as discussed in the remainder of this section, the budget estimate for these upgrades is based on a estimated lump sum of figure of $500,000 to $3,000,000.

As discussed earlier in Section 6, the "potential cost" represents high-end cost estimates to build a state-of-the-art facility. Since the SRF area is an improved area with an infrastructure system, a "realistic budget" range is given that more closely approximates the estimated costs. Detailed breakdowns for costs associated with the SRF area are provided in Appendix E.

Potential Cost:	N/A
Realistic Budget Range:	$500,000 to $3,000,000

Key New Cost

Crane, Equipment and Building Upgrades

7.2.1 Comparison of the SRF with Competing Shipyards

In preparing this plan, other ship repair facilities were examined and analyzed from a broad operation-level perspective. The review included ship repair facilities located around the world, but focused primarily on the Pacific Region and Asia. The shipyards studied varied broadly in terms of size, from operations with as low as 10 to 20 employees to major operations with more than 5,000 employees. The extreme range illustrates the variances in the nature and complexity of ship repair functions that are being provided.

7 Reuses for the SRF Area

This survey was designed to provide preliminary input for determining the optimal type of a privatized SRF. That inquiry is the focus of the analysis which appears below. In addition, the same survey was used to help identify competing ship repair yards. Those facilities are discussed in Section 3.6 of the Market Assessment.

Although no single criterion is capable of providing all relevant shipyard differentiations, our review found that the following three inter-related measures are factors worthy of some discussion.

7.2.1.1 Size. As stated above, the size of shipyards varies widely. In this discussion, size refers both to number of employees and scope of capabilities.

Almost all of the larger shipyards (e.g., in the 500 to 5,000 employee range) are engaged not only in ship repair services, but also in ship building activities as well. In the Pacific, this correlation is demonstrated by a number of firms in countries such as Japan, Indonesia, Korea, and Singapore.

On the surface, the SRF does not lend itself to engaging in ship building activities. While there are some advantages to building ships in Guam, specifically because of the provisions of the Jones Act (Merchant Marine Act of 1920)[1], it would be a risk-intensive and difficult initiative. Although ship building is possible at a site such as the SRF, it has no history of ship building activity. Moreover, the worldwide maritime industry is intensely cost-competitive. The SRF is distant from a readily-available source of steel and other raw materials, its labor rates do not compare favorably with certain other Pacific countries, the supply of skilled labor in the general economy is relatively small (there is limited surge capability) and the government is not in a financial position to semi-permanently subsidize the industry.

A number of medium-sized ship repair firms do exist without ship building activities. Firms of this size must be capable of providing full-service ship repair activities to maintain a workforce in 250 to 500 range. Full-service capabilities are discussed in more detail in the following subsection.

[1] The Act restricts the carriage of domestic coastal and inter-coastal trade to U.S. flag vessels. The vessels must be built in the United States, documented under U.S. law, and owned by U.S. citizens. The law effectively prevents foreign shippers from moving goods between the U.S. and Guam, even as an intermediate stop between the U.S. mainland and Asia. Please see Section 5.2.1.1 for a more detailed discussion.

7.2.1.2 Capabilities. A so-called "full-service" ship repair firm normally has all or nearly all of the following basic capabilities:

- Drydocking (size and capability varies)
- Lofting (drawing of hull profiles)
- Rigging repair
- Electrical repair
- Topside repair
- Machinery repair
- Welding
- Hull preservation
- Pipefitting, piping installation and repair
- Propeller repair
- Steel plate work (include shearing, rolling, flanging, forming, and bending)
- Carpentry and woodworking
- Sandblasting and painting
- Sheet metal and structural steel repair
- Boiler repair (including boiler retubing)
- Steam and gas turbine repair
- Air conditioning and refrigeration repair (including compressors, coolers, valves, and controls)

Additionally, some repair yards may also offer specialty types of repairs which could include:

- Ultrasonic metal thickness gauging
- Asbestos abatement
- Computer-controlled burning tables

Of these listed capabilities, the most important one may be the existence of drydock capability. A drydock is necessary for major overhaul work that can provide many manyears of labor. In addition, larger ships generally are more complex than the smaller

ships, again needing more manyears of labor. Among many mid-sized shipyards, their work capabilities are limited by the size of their drydocks. Often, a shipyard may only have a drydock in the 300-600 foot range. Many of the larger commercial ships require drydocks capable of accommodating vessels greater than 1,000 feet.

Of course, drydocks can be a major operational cost. While a shipyard may need a drydock to attract substantial work, it must have a minimum level of work to justify the maintenance of the drydock.

The fact that the SRF already has full-service capabilities makes it logical to use that capability to its advantage. The presence of these capabilities, especially in a geographic area without nearby full-service competition, could make the SRF an attractive business opportunity if enough workload exists to absorb unavoidable overhead costs.

7.2.1.3 Customer Market. Another means of differentiating between ship repair facilities is by examining their customer base. For example, it is rare to find U.S. Navy work at a small shipyard for a number of reasons. The Navy enters into Master Ship Repair Agreements (MSRAs) with the shipyards that it intends to use. The Navy MSRAs must meet specific service and capability standards which often rule out smaller shipyards. In addition, smaller shipyards normally do not have the administrative infrastructure needed to comply with Navy requirements.

Some shipyards target certain markets due to the availability of business or the suitability of that market niche for its capabilities. For example, some shipyards target the area's recreational marine work. While a smaller shipyard located in an area with such ships may gain substantial support from such work, most medium and larger sized shipyards find it hard to perform such work at competitive rates due to their higher overhead structure.

The potential market for SRF services is discussed in considerable detail in Section 3 of this report. The current existence of Navy workload, and the potential for Foreign Military Service work, would seem to provide a logical fit for the mid-sized, full-service ship repair facility currently in place. In addition, this approach is likely to maximize realistic potential employment at the SRF.

7.2.2 Workload Considerations

The market assessment discussed in Section 3 is summarized in Table 7.1. The total estimated potential workload for a commercial, privatized SRF is not insignificant. The

7 Reuses for the SRF Area

required direct labor manyears, 481, is more than that currently available at the Navy's partially downsized SRF. While the data is extremely favorable, it is essential that the figures be evaluated in terms of probability of occurrence.

The accuracy of the forecast depends on the occurrence of assumed future events which cannot be absolutely assured. Moreover, the forecast becomes more speculative for longer forecast periods. That is, while it may be assumed with some degree of confidence that the MSC ships will continue to use FISC, Guam, as its primary supply point for the next two to three years, the confidence level drops for periods five years hence. This point is more than a purely academic and theoretical one. As this plan is being written, the Navy has made a preliminary decision to relocate its Diego Garcia supply mission to Japan. Citing reduction in labor costs, the Navy is asserting that approximately $2.8 million dollars per year will be saved. In addition to questioning the cost savings figures and the number of personnel positions that are actually dedicated to the Diego Garcia mission, Guam's long range concern is with the impact that the relocation will have on the viability of FISC, Guam. Loss of the Diego Garcia mission could have a negative ripple effect on the FISC. The scenario could be as follows:

- The Navy relocates the Diego Garcia mission from Guam to Japan

- Loss of the Diego Garcia mission reduces FISC, Guam's, supply stockages. The amount of impact on the FISC is being debated actively. Some argue that the Diego Garcia supply represents as much as 60 percent or more of FISC, Guam's total mission. Others claim that it is far less.[2]

[2] Guam has requested a copy of the Navy's "Business Case Analysis" that evaluates the various alternatives for stationing and operation of the Diego Garcia shuttle. Both COMNAVMAR and CINPACFLT have acknowledged the request. The document, however, is yet to be released by the Navy.

7 Reuses for the SRF Area

Table 7.1
Summary of Potential SRF Workloads
(Manyears)

Client	Workload
Military Sealift Command (MSC)	180
Seventh Fleet Voyage Repairs	6.6
Maritime Prepositioned Ships (MPS)	0.6
Diego Garcia Supply Run	0[1]
U.S. Coast Guard	19
On-Shore DoD Activities	58
Large, Commercial Shipping Companies	0[2]
Long Line Fishing Boats	1
Purse Seiners	0[3]
Small, Privately-Owned Pleasure Crafts	12
Small Scale Industrial Repairs	4
Foreign Military Sales (FMS) Program	200
Totals:	481

1 Diego Garcia Supply run is assumed to be relocated to Japan.

2 While the potential exists for securing repair work from commercial shipping companies, for purposes of this report, the initial short-term projection is assumed to be negligible.

3 Because purse seiners represent a specialized, niche market, the assumption is that they will continue to prefer working with established distributors of nets and hydraulic systems rather than switching to a general shipyard.

- Because FISC, Guam's, supply capability is decreased due to the loss of the Diego Garcia mission, the MSC decides to relocate its fleet resupply mission to Japan also.

- Relocating the MSC mission from Guam to Japan means loss of ship repair opportunities for the SRF. Since MSC ship repairs represents the core SRF business, loss of the business could dictate the very viability of a ship repair facility.

Positive forecasts are similarly difficult to estimate for the long run with confidence. For example, while it has been assumed that there will be no ship repair work performed on

large, commercial ships in the near term, innovative and aggressive marketing, coupled with the development of a reputation for excellence by a newly privatized SRF, could certainly change that outlook five years hence.

In order to address these concerns, three alternative scenarios should be considered for the SRF:

Base Case: This case represents the most likely event. All forecasted workloads shown in Table 7.1 will occur except for the FMS program. In particular, the MSC ships will continue to be forward deployed to Guam, and FISC, Guam, will continue to provision them with supplies for the deployed Pacific fleets. The forecasted SRF workload under the Base Case is approximately 280 manyears of direct labor.

Optimal Case: This case represents optimum conditions. Guam is successful in retaining all of the workloads of the Base Case, and through aggressive, innovative, and pro-active marketing, is successful in establishing a continuing repair and refurbishment program for ships being sold to Asian countries under the Foreign Military Sales program. The forecasted SRF workload under the Optimal Case is estimated at 480 manyears of direct labor.

Worst Case: This case represents the condition where relationship with the SRF's principal client/customer, the U.S. Navy, deteriorates to the point where the ships of the MSC cease considering SRF, Guam, for repairs. Moreover, SRF Guam is unsuccessful in securing work related to the FMS program. The forecasted SRF workload under the Worst Case is approximately 100 manyears of direct labor.

The three cases show clearly that two customers will exert significant influence on how any new, privatized SRF would develop, function, and structure itself. The continued presence of the Military Sealift Command and the initiation of work under the Foreign Military Sales Program, more than any other combination of factors will dictate the terms under which the new SRF would operate. It is quite obvious that the Government of Guam must focus its marketing efforts on the retention of the MSC and the securing of FMS work in order to achieve its vision of becoming a major shipyard in the Western Pacific, capable of competing with the largest and most efficient yards in Asia.

Because MSC and FMS will be the keys in determining the future of the SRF, the three alternative cases can also be viewed in the following manner:

Base Case: Either MSC or FMS work is retained by the SRF.

Optimal Case: Both MSC and FMS work is retained by the SRF.

Worst Case: Neither MSC nor FMS work is retained by the SRF.

While the Government of Guam will certainly strive to attain the optimal case, for planning purposes, a private shipyard operator/owner will likely assume the base case for initial start-up—the operator can always expand if the work doubles. Moreover, sizing the SRF for the base case would allow another port-related function to be collocated in the SRF area. While conventional thinking may discount such a concept, there are a number of positive elements with locating functions other than a ship repair yard at the present SRF site. These considerations are discussed later in Section 7.5.

7.2.3 Size and Capability Considerations

7.2.3.1 Overview. A commercial operator of a privatized ship repair facility would need to survey the potential market carefully in balancing the need for specific repair and maintenance capabilities against the costs of retaining those capabilities. Although maintaining the comprehensive level of capabilities now found at SRF Guam would maximize customer opportunities, a commercial operator would almost certainly conclude that some reduction in staffing and infrastructure costs would be required to have a realistic expectation of profitability.

A privatized ship repair facility would need to maintain most of the capabilities now present at SRF Guam in order to satisfy its potential government customers. A review of other commercially operated shipyards and an assessment of likely market demand, however, reveals the potential for meeting workload requirements with a significantly reduced infrastructure.

7.2.3.2 Scope of Size and Capabilities at a Privatized SRF. SRF Guam maintained a substantial infrastructure at the site even as overall employment and workload declined. The current SRF inventory includes over 70 buildings with approximately 440,000 square feet on a site with over 100 acres. Although the size of a privatized SRF would ultimately be a subject of negotiation between the commercial operator and the Local Redevelopment Authority, an analysis of the likely workload indicates that a privatized SRF could be largely consolidated into one or two major buildings.

Despite the reduction in facility size, it would still be possible to retain most of the SRF's functional capabilities and to continue to serve the major SRF customers. The one significant capability that the SRF would need to maintain is a single drydock, which is both sufficient and necessary for the base case scenario. One drydock could be maintained even with a consolidated configuration for servicing the projected base case workload.

That level of workload, would be ample to support the overhead costs associated with a drydock operation. Conversely, however, loss of drydock capability would significantly impact the scope and capabilities of a privatized SRF facility.

7.2.3.3 Feasible Overhead Cost Savings in Infrastructure Expenses. The proposed consolidation of a privatized SRF to a limited number of buildings would result in major cost savings in overhead. Such an operation would be spared the costs of maintaining and sustaining the upkeep of much of the existing SRF, some of the older buildings having passed their useful life. In addition, the reduction in the size of the infrastructure will, in turn, permit a reduction in personnel needed to support the unnecessary infrastructure. Finally, the contemplated consolidation and reduction in infrastructure would result in correspondingly reduced utility expenses.

7.2.3.4 Potential Uses for Property Available Due to a Reduced SRF. Assuming that a commercial operator opted for a reduced scope of operations at a privatized SRF, a substantial amount of property and infrastructure would be available for other uses. While this topic is discussed in more detail in Section 7.5, it is important to note that certain reuses of that property have the potential for helping to generate additional ship repair and maintenance workload. Those potential reuses could prove useful in attracting and retaining a commercial operator at the SRF site.

7.2.4 Cost Considerations

7.2.4.1 Overview. It is critical that a commercial ship repair facility at the SRF Guam site be cost-competitive. Most of the potential commercial customers of the repair facility are very cost-sensitive and have demonstrated a willingness to travel to relatively distant shipyards for less expensive repairs. In addition, governmental customers are also cost-sensitive to varying degrees. While the United States Navy also balances other considerations (strategic deployment issues, maintenance of support infrastructure at or near homeport locations, and maintaining positive relationships with allies, for example), budgetary pressures have served to increase the role of financial considerations.

Within the Defense Department, the Miliary Sealift Command (MSC) operates much more like a commercial operation than most other branches of the service. Accordingly, retention of MSC workload will be significantly influenced by the ability of a commercial operator to provide cost-effective repair and maintenance services.

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In the following subsections of this report, recent overhead costs at SRF Guam are examined. Then, a cost analysis for sustainable overhead costs at a privatized, economically viable SRF is performed. Finally, the report discusses methods that a commercial SRF operator could use to achieve the savings needed to adjust SRF overhead costs to a level that would permit a successful privatized operation.

7.2.4.2. Current SRF Guam Overhead Costs. All current SRF Guam overhead costs are directly funded by the U.S. Navy. In order to analyze the likely overhead costs for a privatized SRF, this report first examined existing overhead expenses. Overhead costs for fiscal year 1995 were used as a baseline for this cost analysis, a period when the SRF had about 430 direct labor personnel:

Table 7.2
SRF Overhead Costs, FY95
($ millions)

Expense Element	Cost
Utilities	$2.0
Property maintenance	2.1
Equipment maintenance	0.7
Training	1.5
Apprentice program	0.6
Drydock maintenance & operation (one)	2.0
Supplies/Other	1.0
Indirect Labor (229 personnel)	11.4
Totals:	$21.3

These overhead costs do not include military salaries and major equipment overhauls, such as the work done on the drydocks or a major crane overhaul. The costs also exclude any significant capital investments and, since the SRF is a government operation, these overhead costs do not include any profits. In addition, the Navy pays no taxes or lease expenses, a significant obligation for a private firm operating the SRF.

The current level of overhead costs is significantly higher than the level of overhead costs that an anticipated commercial operation could support. These figures, however, provide a basis for projecting privatized overhead costs and assessing the validity of those projected figures.

7.2.4.3 Projected Overhead Costs of a Privatized SRF. Obviously, the amount of overhead costs sustainable by a commercial business will be directly related to the size of the SRF workload. The figures below use the "base case" described in Section 7.4.2 of this report. A summary cost analysis was performed using the following parameters:

Target Direct Labor (DL) Manday Rate $275

Our review indicates that this rate would be competitive with the Navy's recent experience with regional private ship repair firms.

Workload 250 Direct Labor Manyears

The base case scenario identifies approximately this level of workload. The majority of this workload comes from continuing work on the MSC Auxiliary Fleet ships located in Guam.

Avg. Direct Labor Salary/Benefits 67% of current $31.10

The current average direct labor salary at SRF is significantly above GovGuam pay scale or salaries paid by local private firms. Fringe benefits including annual and sick leave are also higher for current SRF employees.

These assumptions would result in a substantial reduction in funds available to support overhead costs. For example, if the reduced average direct labor salary and benefits of $167 per eight hour manday (2/3 of the current average SRF Guam rate) occurred, only $108 of the $275 projected manday rate would be available as a contribution to the overhead and profit of a private SRF. Using the 250 direct labor manyear workload in the base case generates a figure of $6.7 million per year for overhead and profit, compared to the $21.3 million spent in fiscal year 1995 for overhead alone at the Navy-operated SRF Guam. Obviously, a very substantial change in the way the SRF operates would be required to meet this reduced overhead cost level.

7.2.4.4 Feasible Overhead Cost Savings in Staffing Expenses. The largest potential source of overhead cost savings for a privatized ship repair facility would result from a substantial reduction in overhead personnel. These reductions would arise not only from adjustment of salaries and fringe benefits to commercial levels, but also from a variety of changed circumstances and practices. Some of the projected sources of these reductions are discussed below.

Reduced Level of Indirect Staffing. In 1995, almost 40% of the SRF's 650 person staff were dedicated to what the Navy categorized as indirect tasks. This level of indirect staffing may be required to perform the administrative functions placed on a Navy activity; however, the same requirements cannot be tolerated in a commercial operation. While the level of indirect personnel at a commercial facility will vary depending on the type and complexity of work performed, we would anticipate a very large reduction in this staff will be made by the commercial SRF operator, perhaps reducing the direct/indirect balance to a 10:1 ratio.

Reduced Staffing Due to Freedom from Navy Standards. A substantial difference exists between the requirements for a Navy-operated ship repair facility and a commercial facility that is licensed to do Navy work. For example, SRF Guam currently has to meet Navy standards for drydock certification and operation, which requires a large dedicated drydock staff, 24 hour staffing, and extensive maintenance activities. These costs are not required of commercially operated drydocks, even when used for Navy vessels. The costs of operating and maintaining a drydock at a commercial SRF could be significantly reduced. While a commercial firm would maintain other equipment and facilities at a level sufficient for continued safe operations, this work could be accomplished with expenditures less than current Navy overhead costs.

Reduced Staffing Due to Reduced Infrastructure. As described earlier in Section 4.2, the SRF currently has a far more extensive infrastructure than necessary (or desired) in a privatized commercial operation. Substantial staffing reductions could be expected from a reduction and consolidation of ship repair facilities.

Reduced Expenditures for Training and Apprentice Program. In FY95, the Navy spent over $2 million on its training and apprentice program, a substantial expenditure given the overall scope of operations. This figure exceeds by a considerable amount, the costs that a commercial facility would normally cover in its operations, particularly given the reduced overall staffing level and infrastructure contemplated in a privatized operation.

In sum, a privatized ship repair facility could achieve substantial savings in personnel costs. In addition to reducing costs by paying prevailing private wages, a commercial operator could expect to reduce staffing levels and costs in a variety of less obvious ways. These savings, combined with the savings discussed below in infrastructure and facility expenses, would be considerable.

7.2.5 Business Entity and Financing Considerations

Failure to successfully achieve a privatized reuse of the SRF Guam would represent a significant setback to the economy of Guam. Although a military facility reuse project can have many laudable goals, an overriding objective in Guam's case is the installation of a commercial operator at the SRF who can attract maximum workload and achieve long-term business success.

At this point, it is difficult to predict accurately the level of interest in a commercialized SRF, much less identify potential contestants for this business opportunity. Nonetheless, local authorities should start to consider the characteristics of a desired entity that will ultimately lease SRF facilities and pursue privatization opportunities.

Before discussing specific and desirable operator characteristics, two issues deserve recognition. First, while we have used the phrases "commercialization," and "privatization" freely, there are those within the Guam leadership who have some interest in—at least temporarily, until a permanent operator could be selected—operating and maintaining the SRF as a Government of Guam facility, or as a heavily subsidized facility. Second, while we have discussed the operation of a commercialized SRF as a single entity, there is the alternative of dividing the existing SRF operations into multiple, independent business concerns.These two considerations are briefly explored below.

7.2.5.1 Government of Guam Ownership. The principle argument for this line of reasoning is that with the closure of the SRF eminent in September 1997, there may be insufficient time for Guam to effectively market the potential of the SRF to commercial business interests. Rather than "mothball" the facility—which would make marketing that much more difficult—proponents of GovGuam participation argue that the territorial government should assume the role of a caretaker. By assuming responsibility for the operation, proponents contend that continuity of operations would be assured, and that the highly-skilled laborers could be retained. Should there be a break in ship repair operations, however brief, many, if not most of these skilled laborers, are likely to permanently seek employment opportunities off-island.

Although the argument appears meritorious, such a venture is not likely to succeed in the all-important imperative to reduce costs, lower overhead, improve efficiency, and build a reputation of excellence to retain the business provided by the Military Sealift Command and to market the facility to attract the Foreign Military Sales program. A principle reason for the Navy's decision to close the SRF was its noncompetitiveness vis-a-vis Asian/Pacific region ship yards. For the Government of Guam, an organization that has no previous experience in operating a shipyard, to substantially improve upon the Navy's

performance while serving as a temporary caretaker, would take a Herculean effort. More practically, assuming shipyard operations will take a tremendous infusion of capital if GovGuam is to operate it in a manner that will enhance the facility's marketability. Recognizing the budgetary constraints under which the Territory operates, Government intervention in SRF operations appears inadvisable.

7.2.5.2 Operation by Multiple, Independent Business Concerns. The principle benefit of splitting the SRF into multiple small businesses that it will promote ownership and operation by local, Guamanian firms. By its shear size, a single SRF as it currently operates would appear to represent too large of an investment and business risk for either an existing Guam firm to assume/purchase, or a new entity to develop. Hence, maintaining the SRF in its status quo state presumes that an off-island investor would assume ownership.

A superficial evaluation would indeed show that the SRF's various shops and departments are conducive to being fragmented into independent repair businesses—for example, a paint and sandblasting shop, a welding shop, a machine shop, an electronics shop, and others. Its downsides, however, are that:

- A group of independent "shops," lacking a common bond, i.e., corporate goal, objective, and standards, will find it extremely difficult to retain the existing ship repair business (i.e., MSC work), much less attract new business. The gradual, if not sudden, loss of ship repair business from the federal government, is almost a certainty.

- The new owners of these small, independent facilities are likely to own an existing business and are merely relocating from a less desirable business location to a new centralized industrialized area. As such, only a minimum amount of new employment is likely to be created.

- While a centralized industrial complex is generally a good concept, and will provide mutual support and promote adjacent businesses, locating that complex on prime waterfront property would not make highest and best use of the area. The independent repair shops, unless it can retain ship repair as their core business—a risky assumption (see "1" above)—are likely to find that their base work is unrelated to ships, ports, or the waterfront. More likely, they will perform such services as automobile repairs, small engine work, and electrical and electronic appliance repairs and calibration.

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Retaining a single, consolidated ship repair organization would be of far greater economic benefit to Guam. In the event that surplus space or facilities are available due to consolidation of functions under the new commercial concern, mixed use alternatives such as those that will be discussed in Section 6 would represent a better alternative.

7.2.5.3 Characteristics of a Successful Commercial SRF Operator. The desirable characteristics of a successful commercial operator of a privatized SRF are similar to those a new operator of any substantial business enterprise might possess. In the case of the SRF, however, these characteristics are underscored by specific factors arising out of the status of the industry in general, and SRF Guam in particular.

First, the commercial operator of the SRF will need to have significant experience and perceived expertise in the industry. The ship repair industry is increasingly competitive and a reputation for timely, efficient, and high-quality work is essential to long-term success. A privatized SRF faces a particular challenge in this regard to overcome perceptions held by the Military Sealift Command that SRF Guam's past work was neither timely nor cost-effective.

In addition, the commercial operator may have a relatively short window of opportunity for ensuring a successful foundation for a privatized SRF. As described elsewhere in this report, the size and scope of future work from MSC is currently being debated, particularly with respect to the Diego Garcia shuttle. Loss of MSC as a steady customer for Guam facilities would have a significant detrimental effect on the prospects for maintaining an economically robust and viable SRF.

Similarly, a successful commercial operator of the SRF would have a strong ability to not only maintain the existing workload, but to attract new business. As a minimum, the operator must have strong track record of proven success and a deserved industry-wide reputation for efficiency and quality.

Access to capital and other resources is also highly desirable for a commercial SRF operator. Although the SRF Guam facilities are in good overall condition, certain capital expenditures are likely to be necessary for any new business venture, including sums needed for consolidating, reconfiguring, and occupying the new site. Sufficient capital reserves are also necessary to accommodate initial business start-up requirements and for cyclical fluctuations in customer demand. While operating the facility, significant capital expenditures would likely be required on a periodic basis for maintenance of existing equipment and infrastructure, as well as possible additional capital investment in the facilities. Finally, perceived capital resources and organizational stability in turn contribute to attracting SRF business.

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7.2.5.4 Foreign Versus Domestic Business Entities. After a careful review of local business activities on Guam, it appears unlikely that a local enterprise can be found which would meet these requirements to an optimal level. Aside from the financial and capital requirements of the endeavor, no local operator has the reputation of having major industrial expertise in this specialized business niche. As stated previously, it is unlikely that any small operator would be given the opportunity to prove its capabilities before major decisions are made about federal workload. In addition, from a Navy perspective, the desire is not for an operator that could simply operate the SRF at the same level of expertise as in the past; instead, an operator will need to persuade MSC and other potential customers that it can operate the SRF more efficiently, more responsively, and more capably than in the past. Only a commercial entity with extensive ship repair experience is equipped to accomplish the objectives as described.

Potential commercial operators for the SRF would almost entirely be found among shipyard operators already located in the Pacific Rim. In addition to possessing the characteristics described above, these potential operators already have a familiarity with the business and repair opportunities available in the area from ships based in or operating in this region. For example, the local fishing fleet largely uses facilities in Taiwan for overhaul and repair work—work that could be performed by a commercial SRF in Guam operated by a knowledgeable and astute owner.

In choosing a commercial operator best able to maximize the prospects of success at the SRF, however, attention must be given to the exciting possibilities of work under the Foreign Military Sales program discussed previously in Section 3.5. Current projections call for a substantial amount of ship repair work in coming years to be performed on ships which are being excessed to Taiwan. In order to remain eligible to perform this work, however, a privatized SRF must not be considered a foreign shipyard.

7.3 Alternative Reuses

Guam's strongest desire is to convert the government-owned and operated ship repair facility into a commercial, privately-owned and operated facility that will maximize near-term and long-term benefits for Guam. Yet, a ship repair facility is not the only alternative that deserve evaluation. Other alternative uses may provide equally positive economical benefit as a commercialized, privately-owned and operated SRF.

These non-ship repair considerations have gained more impetus because of the recent reversal by the Navy in regard to the requirement for Guam to maintain at least a minimal

ship repair capability. The change in the Navy's position allows Guam to consider the entire spectrum of economic development concepts. Thus, although retention of the ship repair facility remains a fundamental goal of reuse—because Guam wants to retain the 400 highly skilled workers currently at the SRF—the ship repair alternative requires comparison with other reuse alternatives.

This section discusses non-ship repair alternatives which include:

- Container and Break Bulk wharves and yard
- Fishing industry support facilities
- Commercial Port and maritime support functions
- Tourist-oriented facilities and activities

7.3.1 Container and Break Bulk Cargo Wharves and Yard

From an economic and market-demand viewpoint, the need to expand the existing cargo handling capability of the Commercial Port on Cabras Island is not immediate. An aggressive and innovate marketing effort, coupled with improved and expanded facilities, however, could cause Guam to become a desirable transshipment point for the Asia-North America trade.

The SRF site offers distinct advantages for container/Break Bulk port expansion. These factors include:

- Over 3,000 feet of existing wharf space in good condition
- Potential for an additional 2,500 feet of wharf with 50 to 60 foot depths
- Central location
- 100 to 150 acres of backland
- Good road access

Two options are worth considering: a dedicated container handling facility, and a general cargo/Break Bulk cargo facility.

7.3.1.1 Container Handling Facility. For Guam to effectively market itself as a transshipment center, it must, as a minimum, have the capability to accommodate today's and tomorrow's large container ships. Most of the world's shipping lines use large post-

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Panamax vessels—those too large to traverse the Panama Canal—that typically have a laden draft of 40 to 46 feet. With the existing commercial draft, at about 34 feet, and the inner Apra Harbor at 26 to 35 feet, both would require major dredging efforts and associated wharf renovations to accommodate these ships. The SRF area, on the other hand, is very deep at its northern edge, having depths that exceed 50 feet. Although construction would require capital expenditure in the millions of dollars, it would be more economical than the effort that would be required either on Cabras Island or in the Inner Harbor.

The significance of a harbor to accommodate these large, deep draft vessels cannot be overstated. The future of world shipping rests with these vessels. Even though smaller vessels are still the norm, the ever-increasing numbers of post-Panamax class vessels means that larger and larger percentage of the world's container cargo is being shipped via these vessels. It is important to keep in mind that the whole point of using these larger ships is to maximize the economies of scale and transshipment logistics. Currently, the larger vessels carry over 6,000 TEU's—7,500 TEU vessels are expected to appear in the not-so-distant future. The economics of moving cargo by a 6,000 TEU vessel far surpasses the use of multiple 2,000 TEU vessels.

The principal reason why Guam is not on any major Trans-Pacific shipping route today is the higher cost of the voyage—it is more economical to transport 2,000 to 3,000 TEU's (Twenty-Foot Equivalents) of container via the northern great circle route than a more equatorial route through Guam. But, should Guam develop a harbor capable of handling the large 6,000 and 7,500 TEU ships just coming into service today, it may offer the economic advantage necessary for causing a shift in the shipping pattern.

Figure 7.2 is a schematic that outlines how, in the long term, the northern edge of the SRF area could be developed into a very deep wharf area. The figure shows the development of a two-berth transshipment terminal in two phases. The alignment is intended to take advantage of the naturally occurring 60-foot deep basin in the area.

Phase I. Conceptually, Phase I provides a 1,200 foot wharf at the east end and a backland area of approximately 50 acres. The drydock, AFDM-8, could remain in-place and operational during the construction period by this phasing sequence. Such a configuration would allow a privatized SRF to operate as well—the SRF's main buildings, 20 and 21, remain intact.

To minimize capital expenditures, Phase I could be further divided into a Phase IA and Phase IB.

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- During Phase IA, a free standing container wharf with access ramps at both ends for container hostlers—yard tractor and chassis units which shuttle the containers to the backlands storage yard—would be constructed. In addition, one or more relatively economical mobile cranes—on crawlers or rubber tires—could be utilized to load/unload the vessels. This would not be a state-of-the-art approach, but it would initiate the use of Apra Harbor by large, post-Panamax ships.

- In Phase IB, the area behind the wharf would be filled and paved, rail-mounted post-Panamax container cranes could be added on rails that are planned during Phase IA, but built during Phase IB. On completion of Phase IB, Apra Harbor would own a state-of-the-art post-Panamax capable container terminal.

Phase II. Phase II would add a second 1,200 foot wharf at the western end. The drydock could be moved to Papa Wharf and the backlands could be expanded to 65 acres, still permitting a full-scale SRF. Moreover, should development be was allowed in the wetlands area (with appropriate mitigation if necessary), then some or all of that 50 acres could also be used as container backlands. Hence, Apra could develop a two berth state-of-the art container terminal of 100 or more acres.

Using a rule-of-thumb estimate that 3,000 TEU per acre per year is roughly the capability for local traffic and 6,000 TEU per acre per year represents transshipment capability, a container facility at the northern edge of the SRF area could accommodate 300,000 to 600,000 TEU per year. Simultaneously, the existing Commercial Port container terminal, which currently handles mainly local cargo, has a capacity of approximately 150,000 TEU per year. (Although current throughput is about 130,000 TEU per year.) Thus, the combined Commercial Port and North SRF area could result in a 750,000 TEU container/transshipment terminal for Guam.

1,200' (POSSIBLE PHASE 2)

WATER DEPTH = APPROX 60'

1,200' (POSSIBLE PHASE 1)

POTENTIAL POST-PANAMAX CONTAINER BERTH
(PHASE 1: 1 BERTH)
(PHASE 2: 2 BERTH)

POSSIBLE PHASE 1A:
ECONOMICAL OPEN WHARF & RAMP STRUCTURE

APPROX. 50 ACRES CONTAINER TERMINAL
(APPROX. 65 ACRES IN PHASE 2)
(FUNCTIONS WOULD BE RELOCATED)

NOTE: CONTAINER YARD/SRF BOUNDARY CAN BE ADJUSTED TO SUIT NEW NEEDS

POSSIBLE PHASE 2 CONTAINER YARD EXPANSION (DRYDOCK WOULD BE RELOCATED)

POSSIBLE ADDITIONAL CONTAINER/OPEN STORAGE FOR LONG-TERM DEVELOPMENT

SRF

DRYDOCK 2032
WALL
EOD AREA
OPEN STORAGE
DRMO
MURRAY ROAD
E STREET
MAIN STREET
U.S. NAVAL SHIP REPAIR FACILITY
BERTH "L-1"
BERTH "L-2"
PARKING
WHARF "N"
BERTH "N"
WHARF "M"
BERTH "M"
WHARF "O"
BERTH "O"
WHARF (P)
BERTH (P)
WHARF (Q)
BERTH (Q)
BERTH (R-1)
BLDG 30
BLDG. 30
WETLAND
WETLAND
SUMAY COVE
INNER APRA HARBOR

NORTH

SRF - POTENTIAL CONTAINER TERMINAL

300' 150' 0 300' 600'
SCALE: 1"=300'

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VZM/Transystems - GMP Associates

FIGURE 7.2

Potential Cost: (Phase 1, 50 acres)*	$30,800,000
Realistic Budge Range:	$12,300,000 to $21,600,000

Key New Cost
Asphaltic Concrete Pavement
Gate House Building
Maintenance and Repair Building
Major Wharf Infrastructure
Dredging and fill (not included in cost)
Gantry Cranes (not included in cost)

* Phase 2 = $9,000,000 to $15,800,000

Dredging. In order to provide ship access to a container wharf along the north edge of the SRF, some dredging may be required. The access channel should be at least 50 feet below MLLW, but need not necessarily be wide enough for two-way traffic—the expected traffic volume would be low enough to allow a one-way channel. Specific channel width considerations are discussed in detail in Section 5.3.

There are several shoals in the area near the north edge of the SRF, but it appears that a reasonable access channel and turning basin could be created in either of two ways. Alternative 1 would follow the existing channel to the Inner Harbor, while alternative 2 would come in on the west side of the shoals to access the new wharf basin from the west end. The first alternative seems the more natural approach, retains existing traffic patterns into the Inner Harbor, and is much more conducive to the phased development of the container wharf. However, it may require more dredging—approximately 250,000 cubic yards versus an estimated 200,000 cubic yards for alternative 2. On the other hand, more dredging could be beneficial because the dredged material could be used as fill for the new wharf area.

7.3.1.2 General Cargo/Break Bulk Cargo. A 10-acre Break Bulk terminal can be developed at the northern edge of the SRF area for the same reasons that were discussed above that made the area is suitable for containerized cargo operations. It could occupy a marginal space of the over 100 acres available at the SRF area. The site is centrally located and is serviced by roads that provide good access. The area, however, may require a more durable pavement. Additionally, while there are large buildings at the site, many may not be easily converted into warehouse facilities. Therefore, it may

require the construction of a substantial storage facility of approximately 90,000 square feet capacity.

Potential Cost:	$9,700,000
Realistic Budget Range:	$1,900,000 to $4,900,000

Key New Cost
Pavement
Warehouse
Minor infrastructure

This alternative has the same positive attributes as that of the container yard. It has the added benefit that Break Bulk, Neo Bulk cargo (non-palletized goods), project cargo (for construction), automobiles, and miscellaneous open cargo goods facilities require far lower capital expenditure than a container yard. As in the case for container transshipments, a significant increase in Break Bulk cargos will not occur in the very near term. Presently, virtually all Break Bulk cargo are for local consumption and heavily dependent on the health of Guam's construction industry.

One option to consider is a joint container yard/Break Bulk cargo facility, much like the existing Commercial Port on Cabras Island. A multi-use facility may be the most reasonable approach until an established pattern of reliable cargo forecasts develops.

7.3.2 Fishing Industry Facilities

Dedicated wharves and land-side facilities to support both long liners and purse seiners are non-existent, and could be inhibiting a more explosive growth of this relatively new commerce. Presently, both long liners and purse seiners virtually compete for wharf space with commercial container ships along Foxtrot wharves at the Commercial Port. The result is congestion and inefficiencies.

The Short Term Plan for Victor Wharf suggested that the southern portion of that wharf be considered for conversion as a fishing industry area. That recommendation remains valid. However, the alternative of using the existing SRF area should not be discounted. The one significant advantage the SRF area offers is superior water circulation. Adjacent to, or in the outer harbor, depending on the exact siting of the fishing wharves, the flushing action of the naturally occurring currents are far more efficient than in the constrained circumstances of the southern end of the inner harbor.

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The SRF area also provides sufficient lands for the construction of a tuna processing facility. While conventional wisdom is that a cannery has no chance of success in Guam because of high labor costs, and it suffers from being stereotyped as an "undesirable" industry, like most other ideas, it does have its strengths. One concept that has been suggested is a highly automated canning operation that uses loined fish. Such an operation requires little manual labor since the labor intensive loining operation has been conducted at a neighboring island state that enjoys a far lower labor rate. Moreover, the proponents argue that the increased fishing vessel arrivals to support the cannery would generate collateral benefits in terms of ship repair, fueling, and other basic needs.

7.3.3 Port Headquarters and Maritime Support Functions

Because the SRF is located at the centroid of both the Inner and Outer Apra Harbors, it has tremendous appeal for use as a command, control, and administrative area. Using the area as a Port Headquarters with an accompanying control tower for the Harbor Master to control harbor traffic is an attractive consideration. The view from a tower located in the vicinity of the present SRF would offer 360 degree surveillance of the environment.

Conceptually, such a Port Headquarters and control tower could be supported by the ample backland area which could accommodate other critical port functions such as:

- Police and Fire Prevention Facilities
- Oil Spill Response Teams
- Water Taxi
- Ferry and Short Cruise Facilities
- Public Access and Recreation
- Tug and Vessel Support Operations
- Bunkering

Typically, these facilities require little footprint areas. Hence, they could easily be combined with each other or other uses—such as a ship repair facility—to produce a mixed-use, but nevertheless compatible-use, area.

7 Reuses for the SRF Area

7.3.4 Tourist-Oriented Facilities and Activities

Guam's economic health depends on the continued growth of its tourism trade. Tourism is Guam's primary source of revenue. Hence, any development plan must ask how it can maintain and promote tourism. The plan for reusing Navy-held Apra Harbor area, and the SRF in particular is no different.

Just as Section 7.5.3 presented arguments for a Port Headquarters and a control tower at the SRF because of its strategic site, a similar case can be made for using the area in support of the tourism trade. It is at the heart of the harbor, it could present spectacular views, and a successful attraction can ease the crowding of the tourist facilities in an almost saturated Tumon Bay.

Among a wealth of possibilities are the following:

- Casino/Hotel Development. Next month, voters in Guam will decide if gambling should be allowed in the Territory. While the results obviously remain to be determined, there are merits to locating a casino/hotel in the SRF area. Besides the excellent views it could present, it could be argued that because the site is relatively isolated from the remaining tourist attractions—and from the general public for that matter—whatever negative effects it may generate could be constrained or controlled. A tourist who visits a casino is typically different than those who come to Guam to enjoy shopping or the natural beauty. In that sense, locating a casino in Apra Harbor could be ideal for it would segregate the tourist by market facilitating service.

- High-Rise Condominium. While not strictly a tourist-oriented venue, a condominium, especially a luxury structure as it would be on waterfront property, would likely prove affordable primarily to off-island investors or businesses. Spectacular views, perhaps better than those available at existing hotels in Tumon Bay, would be offered. On the other hand, the use of prime water-front property for a non water-dependent use may not provide for optimal land-use.

- Cruise/Day Cruise Terminal. Like the fishing industry discussed earlier, one short term alternative for the Victor Wharf and Drydock Island area was the use of these areas to support the growing needs of the day cruise industry. That fact, however, should not deter consideration of the SRF area for the same purpose. The SRF area offers, for example, a better central location than the Victor wharf area, and is more accessible to the outer harbor where snorkeling, diving, and the dinner cruises occur.

7 Reuses for the SRF Area

7.4 Recommended Plan of Action

Obviously, the mere presence of a tremendous amount of highly qualified skills and the availability of a working facility argues for continuance of a ship repair function. In the short term, that is certainly a viable alternative, and could even offer extraordinary growth, if Guam is successful in capitalizing on the substantial work offered by the Foreign Military Sales Program.

At the same time, however, there are no guarantees that the present base workload will be sustainable. There remain serious questions about the long term intent of the Military Sealift Command, a key, in fact critical, element to SRF restructuring. Moreover, marketing skills will be as important as the efficiency, cost structure, quality, and performance of the SRF itself.

Given the uncertainty of the long term MSC workload, the SRF must aggressively secure a diversified client base. As a start, the Local Reuse Authority should actively investigate the potential for a joint venture between a Taiwanese entity and a local Guamanian industrial operator. This proposal has many advantages:

- Taiwan already has a capable and sophisticated ship repair industry with several logical potential business candidates;
- The Taiwan Government would have a natural incentive to request that the ship repair work done on Foreign Military Sales ships be performed in Guam, both due to Guam's competitive rates with U.S. shipyards, and due to the monetary profits that would accrue to a Taiwanese company;
- Because the SRF would have a Taiwanese financial interest, a synergistic relationship could develop between it and other Taiwanese concerns, such as the Taiwanese fishing fleet, resulting in an increase in the repair of long liners and purse seiners.
- Guam would benefit from developing a solid local business entity with stronger local ties and concerns; and, most importantly,
- This proposed business entity would appear to have the greatest prospects for attracting workload, maximizing local job preservation and growth, and expanding the local economic development.

If this option is well-received by the Local Redevelopment Authority and the community, an aggressive, but well formulated and organized marketing strategy should be developed

and undertaken on a timeline consistent with the projected SRF Guam closure date of September, 1997. Premature, casual approaches to untargeted individuals must be avoided. A sophisticated marketing strategy coupled with precise execution is paramount to success in this politically sensitive arena. Although Taiwan has been specifically cited, other Asian nations with potentially robust FMS programs should also be marketed and not discounted.

In the long term, regardless of the success of the ship repair business, other alternatives, particularly those that are water-dependent, such as a transshipment container yard, appear attractive for mixed use of the SRF area. One of Guam's primary visions is to become a major, if not *the major* transshipment center in the western Pacific. That dream will be difficult to realize without a harbor capable of handling large post-Panamax vessels of 6,000 TEU and greater with drafts in the 40 to 45 feet range.

While there are deep waters in the present commercial port area, the area most often mentioned as a possible site for a new transshipment container terminal—between Golf and Hotel piers—has several distinct and compelling disadvantages with respect to the development of a major container transshipment terminal. Among them are that:

- The water is too deep. With depths over 100 feet, it will be extremely expensive to develop a wharf and backlands in this area, whether by fill or by a floating structure (docks and wharves).

- The available area is too narrow to provide an efficient backlands configuration. Typically, container terminal backlands are 1,500 to 2,000 feet deep. Only rarely is 1,000 feet considered acceptable. The existing commercial port is approximately 800 feet deep, and an expansion would be similar in depth. Transporting offloaded containers from a new terminal in the vicinity of Golf/Hotel piers to larger expanse areas near the current Cabras Industrial Park would likely prove so inefficient that it would not be economically feasible.

These considerations suggest that for the long term, Guam should keep its options open with respect to the use of the 50 to 100 acres that are not needed for a full-service and privatized ship repair facility. Should future events and effective marketing result in a positive outlook for Guam to transform itself into a major transshipment center, then the northern edge of the SRF area could prove ideal. Should transshipment capabilities be not realized, the area could serve as a new Port headquarters and administration area with a control tower for the Harbor Master. The SRF area is sufficiently large that multiple functions can co-exist. In the long run, use of excess areas for functions compatible with ship repair in a mixed-use atmosphere, will result in an ultimate win-win solution.

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Reuse of the FISC

8

8 Reuse of the FISC

In the language of BRAC 95, the Fleet Industrial Supply Center is being disestablished—not closed—meaning that its present command structure (organization) will be eliminated, but its functions will continue to be performed under a different functional arrangement.

The Navy's desire to disestablish the FISC results from their conclusion that a FISC was only needed to support a large, homeported fleet. Due to significant reductions in the local military ship customer base, the maintenance of FISC, Guam was no longer deemed cost-effective. What ship traffic remained, could be served through other operations.

In fact, however, the extent to which Military Sealift Command (MSC) ships will remain forward deployed in Guam is still an open question. In addition, many of the facilities associated with the FISC have an important value to the U.S. Navy, given Guam's strategic location and regional uncertainties.

As a result, the Navy has expressed a desire to maintain ownership and operational control of the FISC. Initially, the Navy intends to outsource only a few specific services. That plan is not advantageous to Guam's economic development. This section offers an alternative that calls for the *privatization* of the FISC—a scenario likely to prove of significantly greater benefit to Guam. That conclusion is drawn from other recent experiences and models of working with the Navy, in which large-scale operations were privatized. The key to success, undoubtedly, will be in finding the mix of operating conditions and controls that meet the needs of the Navy as well as the need for economic revitalization of Guam.

8.1 Privatization of Services

8.1.1 Background

At present, the Navy is considering two options for the disestablishment: (1) Converting the FISC into a "department" under NAVACTS, and (2) Converting the FISC into a "detachment" under the FISC at Pearl Harbor, Hawaii.[1] Under either alternative, the Navy proposes to systematically convert the FISC into a government-owed, contractor

[1] At the September 10, 1996 Executive Staff Oversight Committee meeting, it was reported that the Navy has made the decision to reorganize the FISC as part of NAVACTS. No further definitive information was available at the time this plan was written.

8 Reuse of the FISC

operated function, ultimately through an all-encompassing single Base Operations Contract (BOS). Current Navy plans call for conversion in four broadly defined phases as follows:

- Phase I, the current phase, provides for a full-service FISC. Some selected functions have been contracted, e.g., Preventive Maintenance for Material Handling Equipment and Maintenance of the FISC Refrigeration Plants.

- Phase II is to take effect on October 1, 1997, when FISC, Guam, converts to a department/detachment under either NAVACTS or FISC, Pearl Harbor. The reorganized FISC is expected to employ approximately 205 civilians. Additional FISC functions are expected to be commercialized through small, individual contracts, while other functions are to be transferred to NAVACTS.

- Phase III would continue the commercialization and personnel reduction process. These changes have been outlined only conceptually, and no dates or numbers are available.

- In Phase IV, all supply functions on the island will be consolidated and managed by a single island-wide logistics support BOS contract. The intent is to consolidate the regional supply needs under the control and management of a single private contractor.

The plan as outlined is not advantageous to Guam for a variety of reasons, including the fact that:

- Federal ownership and operation of the FISC deprives the local government of tax revenues; more importantly, however,

- Federal ownership and operation of the FISC not only hinders the development of a robust private shipping industry needed for optimal redevelopment of the former Navy facilities, but also the successful development of other surplus Navy facilities; and,

- If the Navy makes future reductions in the Guam supply operations, the resulting excess facilities may not be transferable under the advantageous base closure regulations.

8 Reuse of the FISC

8.1.2 The Privatization-In-Place Option

Although the Navy has expressed a preference for maintaining ownership and operational control over releasing the FISC for a more traditional local base reuse effort, a third option, which may be mutually satisfactory, does exist—privatization-in-place, sometimes referred to as "PIP." This nontraditional approach is currently being executed at a few naval facilities. In basic terms, it calls for a procurement process in which a major contractor capable of operating a defense facility is selected. The PIP alternative has advantages for both the Navy and Guam:

8.1.2.1 Advantages for the Navy. The Navy is undergoing a serious, long-term, and real reduction in budget. All of the services are seeking ways to maintain force structure and readiness in the most cost-efficient method possible. Turning the FISC over to a private operator is an option for cutting infrastructure and other operating expenditures and releasing funds for other pressing defense priorities.

Experience has demonstrated that in many circumstances, private contractors can operate facilities more efficiently than the Department of Defense. A private operator has more of an incentive to make productive use of a facility due to the potential for realizing profits. Furthermore, private contractors have also been proven more flexible and capable of adapting to changing needs and circumstances. Private contractors can operate with more freedom from the strictures of federal procurement and personnel regulations.

If the Navy is convinced that it could save money through private operation of the FISC, and still retain present and future defense capabilities, the Services would be willing to explore this option. The Navy should be at least willing to grant Guam the opportunity to make its case for privatization-in-place.

8.1.2.2 Advantages for Guam. Privatization-in-place also offers major advantages to individuals interested in the economic development of Guam. Guam has been restricted in its ability to contend with other competitive shipping operations due to the Navy's devotion of its facilities almost exclusively for military needs. The reduction in U.S. Navy presence now creates an opportunity for Guam to cultivate a broader private shipping industry through shared or joint use of the existing port infrastructure.

A private operator of the FISC would have the incentive to facilitate shared use possibilities. A broader customer base would serve to distribute fixed overhead costs and lower charges, making the facility more competitive and maximizing profits. Furthermore, the private operation of the FISC can have a synergistic effect with other redevelopment

initiatives for Guam's harbor facilities. The cumulative effect of these efforts will be to retain and attract workload to Guam, resulting in higher levels of port employment.

Additionally, if future Navy operations decline, if a PIP is operational, the community would have a head start on developing the economic activity needed to offset the loss of Navy business.

8.1.3 Securing Navy Consideration

In recent years, the Navy has evidenced a willingness to consider innovative arrangements such as privatization-in-place. For PIP to receive serious consideration, Guam must set forth a credible plan outlining its ability to accomplish its goals. Such a plan must demonstrate to the Navy the likelihood of two credible players:

- A Local Redevelopment Authority (LRA) with the skill and expertise to manage a privatization process; and
- A proven private contractor capable of managing a facility of the magnitude at which privatization is sought.

8.1.3.1 A Credible Redevelopment Authority. Guam has many advantages in pursuing the privatization option. Its local redevelopment authority has a broad array of economic expertise. Moreover, due to the vital role that shipping and port activities play in the economy of Guam, it is gifted with a number of individuals who have a requisite degree of sophistication in this industry. Finally, due to the large federal presence in Guam, many members of the community supporting economic revitalization have exposure to government contracting issues.

Members of the Guam BRAC team, including its consultants, have specialized expertise with privatization-in-place options with the Navy. The Guam team has worked with the Navy to achieve successful privatization at the Naval Ordnance Station, Louisville, and have followed closely the steps taken to achieve a somewhat similar privatization at the Naval Air Warfare Center at Indianapolis. This "hands-on" experience with Navy decision-makers gives credibility to the Guam team and proposal.

8.1.3.2 A Credible Private Contractor. Attracting a credible private contractor to Guam requires a certain amount of faith in the privatization plan and the opportunities it presents. The Guam team remains optimistic that one or more proven contractors would

be interested in assuming FISC operations. The outlook is based upon the volume of workload currently exercised at the FISC, the team's experience with shipping and port operations, preliminary explorations with relevant industry players, and experience with other privatization initiatives.

It is a foregone conclusion that Guam will be in a better position to confirm the potential for attracting and contracting with a major industrial operator as the contracting process goes forward. The Navy has the freedom to withhold final approval until the contracting process attracts a suitable and acceptable operator. The process can be best understood by reviewing two recent privatization efforts.

8.1.4 The Privatization Process

Military base privatization involves a broad range of legal and business considerations. Little exists in terms of authoritative literature; across the country, the book is still being written on which approaches offer the best prospect for success. One of the most valuable sources of expertise comes from practitioners familiar with real world case studies on attempts to create viable base privatization.

The decision on what method should be used for the selection of contractors for privatization, along with other key privatization matters, will depend upon the individual facts of each installation. Two of the most prominent BRAC privatization efforts provide insight into possible approaches:

- The Naval Ordnance Station Louisville Approach
- The Naval Air Warfare Center Indianapolis Approach

8.1.4.1 The Louisville Approach.

Factual Background. Louisville had several specific factors impacting its privatization efforts. First, through a careful campaign that began well before the BRAC 95 recommendations, local officials solicited Navy support for privatization-in-place of its major existing workload. It was anticipated that the workload arising out of maintenance of two major weapons systems would be performed by the two Original Equipment Manufacturers (OEMs), Hughes and United Defense, a subsidiary of FMC Corporation. Louisville's efforts were successful at gaining broad support for privatization-in-place in the Pentagon, from the career staff up to the highest civilian officials.

With the Navy's support, however, came a strong Pentagon preference for the least technologically risky privatization approach, i.e., having the OEMs perform the maintenance of the equipment they manufactured. The Navy's concern for maintaining the quality and integrity of its maintenance process played a primary role for this preference, although staying with existing contractors also facilitated certain government procurement mechanisms as well. In order to preserve the support for keeping naval workload at Louisville, local officials began negotiating with the two OEMs during the BRAC process that culminated in signing of preliminary memoranda of understanding prior to the actual BRAC recommendations.

Because of the broad Navy support given Louisville's effort, contractors had a greater sense of assurance that the workload would remain at Louisville, even absent any absolute guarantees. Consequently, other major defense contractors, in particular Lockheed-Martin, also expressed an interest in the privatization efforts at Louisville. After the BRAC recommendations were formally issued (including certain pro-privatization language that was only contained in the Louisville and Indianapolis recommendations), Louisville officials were faced with the decision of whether to continue to negotiate with the two OEMs or whether to opt for a broader selection process.

Contractor Selection. Louisville officials opted to continue with the negotiated process for contractor selection. Louisville never advertised the opportunities for privatization-in-place. Instead, informal contracts and word of mouth spread the news. Likewise, Louisville never issued a request for proposals or qualifications.

Ultimately, the LRA for the Louisville facility voted to execute agreements with the two OEMs. Prior to this vote, officials did broaden their negotiations to include Lockheed-Martin, and those negotiations helped them have leverage for extracting additional concessions from the OEMs. With the further concessions that were obtained, officials decided they did not want to disrupt the foundation they had established and the plans in progress with the Navy.

Evaluation. Louisville's approach has both advantages and disadvantages. By limiting its negotiations to only a few major defense contractors, Louisville was able to handle its selection process quickly and efficiently. Developing a comprehensive RFP and conducting a formal selection process can be lengthy and expensive. In addition, an RFP can lock in certain selection criteria and weighting for these criteria, limiting the decision-makers authority and adding to the grounds for possible bid protests.

The Louisville approach also offers more freedom for negotiators to consider factors which may be harder to assess or quantify in a more formal document. For example, Louisville officials had discussions with the OEMs over the commitment to bring in additional workload to the plant and assurances that the OEMs would not move the military workload to other facilities.

On the other hand, the Louisville approach does not attract the broadest potential contractor interest. Some qualified contractors may not learn of the opportunity, and others may choose not to participate based upon a perception that the selection may have already been made. Fewer competitors for privatization work can lead to diminished competitive forces that might lead to more favorable offers for the LRA. Louisville was not able to attract the most favorable terms from the incumbent OEMs until it began discussions with Lockheed-Martin.

In addition, the informal selection process can be viewed with suspicion by individuals with stakes in the reuse process. Louisville experienced a certain amount of friction with its union workforce over its overall support for privatization, although it lessened these concerns by requiring the contractors to recognize the unions after it made its hiring decisions. Absent equivalent fixed price bids and a formal scoring system, however, members of the LRA lack political cover from allegations of disgruntled participants in the selection process. Even the Navy was initially hesitant about the lack of a public competition, requiring some additional study and review of the issue before concluding that it was a matter best left to the discretion of the LRA.

Overall, the Louisville approach served the purposes of the LRA. It enabled them to engage in an inexpensive selection process focusing on certain major defense contractors without the distraction of dealing with smaller, less qualified companies. The base attracted enough competitive interest, even without advertising, to provide competitive pressures that improved the ultimate contracts. The Louisville approach allowed the LRA to consummate final agreements with their targeted contractors, and it enabled them to complete the process in a time frame consistent with Navy desires for privatization transition.

8.1.4.2 The Indianapolis Approach

Background. Indianapolis faced a different set of factual circumstances than Louisville. Unlike Louisville, Indianapolis did not have any logical and obvious choice for a privatization contractor. It had no strong ties to a single OEM or defense contractor. Further, Indianapolis did not discern any preference for any particular incumbent defense contractor from Navy officials.

8 Reuse of the FISC

Indianapolis also had taken a very different pre-BRAC approach to privatization. Rather than negotiating with companies in order to obtain expressions of interest to support their privatization desires, its focus had been on the development of detailed privatization information and analysis. The information and materials developed during this process helped form the foundation for its contractor selection process.

Contractor Selection. Indianapolis opted for a formal public competition. Using the materials already developed prior to the BRAC recommendation, the LRA was able to solicit Navy input and then issue a detailed RFP in a relatively short period of time. The use of an RFP allowed for very specific presentation of the community's goals and objectives. The process included pre-proposal conferences held by the LRA and the Navy, as well as the opportunity for written question and answer responses by the LRA. One feature worth noting was the LRA's use of an Internet site to distribute information about the solicitation, an avenue which could prove especially useful for Guam.

Indianapolis received a good response to its RFP; eleven proposals were submitted. After evaluating these proposals, they short-listed four of the offerors. The short-listed firms—Hughes, Lockheed-Martin, SAIC, and Battelle—were invited for on-site interviews conducted by the LRA. Ultimately, Hughes was selected for the work.

Evaluation. Again, this approach had advantages and disadvantages. Developing the RFP and conducting the formal competition process can be expensive and time-consuming. The LRA had to spend a considerable amount of time running the process and evaluating the competitors. This process, however, drew a good competitive response from a strong field of defense contractors.

Similarly, the use of an RFP cuts both ways. Being very specific with the LRA's requirement and expectations can lessen the amount of time needed for contract negotiations. On the other hand, this approach can limit the LRA's ability to be flexible in considering issues that were not contemplated prior to issuing the RFP.

In implementing the public competition, Indianapolis did an admirable job in implementing the process in a disciplined and time-effective process. [The City of Indianapolis had extensive experience with privatization of city services, which proved a major asset.] Because of the amount of time involved in Louisville's protracted negotiations with potential contractors and broad consultations with involved officials, the two facilities are at roughly comparable stages in the reuse process.

8 Reuse of the FISC

8.1.5 Recommendations for Guam

Both the Louisville approach and the Indianapolis approach appear to have been successful for each base's privatization effort, although with different benefits and costs for those efforts. Neither approach is inherently better than the other. The key is to develop an approach consistent with the facts present in Guam.

Guam's background resembles more closely the Indianapolis model in certain key aspects. First, Guam has a greater need to attract a broad range of competition for several reasons. Guam's facilities do not have obvious incumbent OEMs that are logical choices for privatization contracts. In addition, the perception of a Navy commitment to future workload that could attract major contractor interest is absent. Further, Guam's relative geographic isolation will make it more challenging to attract a range of potential contractors sufficient to ensure a good level of competition. For these reasons, the use of public competition is recommended.

In conducting public competitions, however, Guam needs to analyze carefully the distinctions between its facilities and those at Indianapolis. Guam faces a much more challenging task in trying to use the standard RFP process than Indianapolis faced. First, Guam will face two extremely diverse privatization challenge with regard to the FISC and the SRF. Second, the Guam facilities and the accompanying contract and scope of work issues may prove to be significantly more complex than the Indianapolis facility. Finally, because of its location and sources of potential commercial business, the Guam solicitations are likely to attract a variety of different companies aside from the normal array of well-known defense contractors.

Guam will need to consider a variety of steps that can enhance their ability to engage in the public contracting process, while at the same time controlling the scope and cost of the competitive process to the LRA. For example:

- Guam will need to undertake a proactive initiative to identify potential contractors in order to attract an array of viable and interested companies to the island

- Guam should consider a request for information from companies prior to the actual public solicitation as a source of input on how it can best structure and enhance its approach to the competition, particularly in the context of the particular facilities involved.

- Guam may find it useful to consider instituting a two-step Request for Qualifications process that pre-qualifies contractors for the public competition. Requiring

less complicated initial submission of a qualification questionnaire can help attract companies who might be daunted by a complicated comprehensive solicitation. This process also helps weed out from time-consuming consideration, companies that appear inadequate for the contract; in turn, those companies selected for the actual submission may be encouraged to go through the expense of developing the necessarily detailed proposal for the contract. The qualification submission could also include the information-gathering step noted above. Finally, this process will allow for individualized negotiations with companies over how their proposal will help meet some of Guam's broader goals for the reuse process.

- Regardless of the procedure Guam uses for its public competition, however, Guam needs to continue to develop the prerequisite information needed as groundwork for an expeditious competition process. Much of the current ongoing reuse work will prove useful for the solicitation process. Once vital information is developed through liaison work with the Navy and preparation of the business plans, however, a point will come when interested stakeholders will have to consider carefully how to balance local goals in competition process. The ultimate structure of the contractor selection will have to consider both larger business feasibility issues and an array of complex legal issues.

8.1.6 Concluding Remarks

The series of steps necessary to implement a privatization-in-place initiative, to include the process of securing Navy approval and the competitive contractor selection process is illustrated in Figure 8.1. Considerable liaison and negotiation with the Navy over a variety of topics ranging from potential Navy workload to setting specific lease terms to protect the Navy's options in a national emergency are foreseen. The process is necessarily lengthy—21 or more months. Nonetheless, we believe the potential advantages of having a robust private enterprise operating the FISC are more than sufficient to outweigh the costs in time and effort needed to realize such an outcome. This calculus is even more compelling when the economic impacts of a successfully privatized FISC are compared with the relatively meager benefits of the outsourcing being proposed by the Navy.

8.2 FISC Warehouse Model

Contractors interested in operating a privatized-in-place FISC would need to know the theoretical throughput capacity of the warehousing that is available. A warehousing model was used to estimate the throughput capability of the FISC's wharf-side warehouse structures. Typically, these warehouses will house the majority of the break bulk cargo.

8 Reuse of the FISC

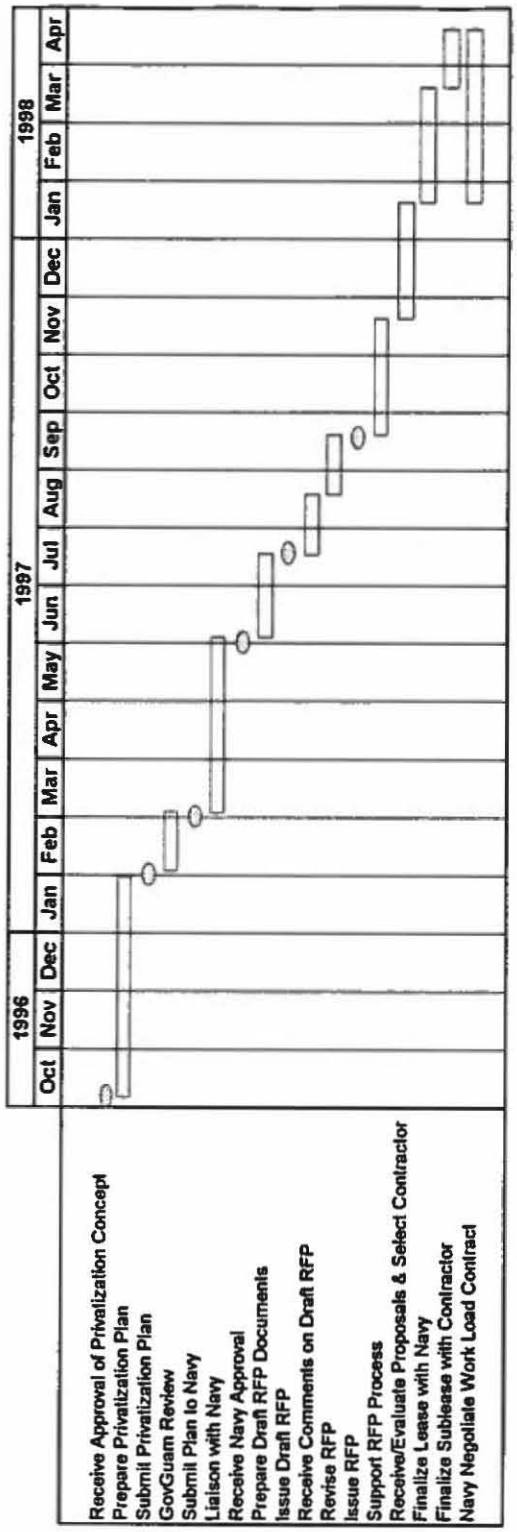

Figure 8.1
FISC Privatization-in-Place Work Plan

Table 8.1
Warehouse Throughput Model

	Buidling										
	3169	780	6009	3179	3180	3187	3186	2116	2118	3201	3202
Square Feet	135,800	81,100	15,300	97,200	97,200	12,000	12,000	97,200	120,000	106,800	86,400
Percent Stacking	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Percent Circulation	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Commodity Density (lbs/cu ft)	20	20	20	20	20	20	20	20	20	20	20
Typical Stack Height (ft)	5	5	5	5	5	5	5	5	5	5	5
Stacking Utilization	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Average Dwell Time (days)	10	10	10	10	10	10	10	10	10	10	10
Percent of Time Peak Occurs	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Ratio to Peak Utilization	2	2	2	2	2	2	2	2	2	2	2
Storage Area	67,900	40,550	7,650	48,600	48,600	6,000	6,000	48,600	60,000	53,400	43,200
Circulation Area	67,900	40,550	7,650	48,600	48,600	6,000	6,000	48,600	60,000	53,400	43,200
Capacity (lbs/ sqft)	100	100	100	100	100	100	100	100	100	100	100
Static Capacity (tons)	3,395	2,028	383	2,430	2,430	300	300	2,430	3,000	2,670	2,160
Net Static Capacity	2,546	1,521	287	1,823	1,823	225	225	1,823	2,250	2,003	1,620
Unfactored Turnovers per Year	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
Reduction Factor for Peaking	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625
Actual Turnovers per Year	22.81	22.81	22.81	22.81	22.81	22.81	22.81	22.81	22.81	22.81	22.81
Warehouse Throughput per Year (Tons)	58,086	34,689	6,544	41,575	41,575	5,132	5,132	41,575	51,328	45,682	36,956
Days Worked per Week	5	5	5	5	5	5	5	5	5	5	5
Hours Worked per Day	8	8	8	8	8	8	8	8	8	8	8
Days per Year	260	260	260	260	260	260	260	260	260	260	260
Hours per Year	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Average Tons Worked per Week	1,117.0	667.1	125.8	799.5	799.5	98.7	98.7	799.5	987.1	878.5	710.7
Average Tons Worked per Day	223.4	133.4	25.2	159.9	159.9	19.7	19.7	159.9	197.4	175.7	142.1
Average Tons Worked per Hour	27.9	16.7	3.1	20.0	20.0	2.5	2.5	20.0	24.7	22.0	17.8

Total Port's Throughput Capability	368,274	Tons
Total Storage Square Feet	861,000	SQ Ft
Throughput Capability Storage/Acre/Year	18,632	Tons/Acre
Number of Terminals	2	Terminals
Average Storage SQ FT per Terminal	430,500	SQ FT
Average Throughput per Terminal	184,137	Tons

8 Reuse of the FISC

The model assumes that each warehouse will operate at equal, efficient, and optimum capacity. The model's parameters are based on warehouse storage and circulation standards. A turnover rate is factored to derive the typical warehouse throughput per year. The per year throughput capacity estimate indicates the amount of covered storage of cargo a port can handle.

Figure 8.2 identifies the main FISC warehouses which would be made available to a independent contractor upon privatization. The total square footage of the available warehousing is approximately 861,000 square feet (20 acres). The operating throughput capacity for these FISC warehouses is calculated to be a little over 368,000 short tons per year or 18,600 tons per acre per year. Details of the model are shown in Table 8.1. Although there are other structures throughout the area, the warehouses identified in Figure 8.1 and listed on Table 8.1 represent the most valuable storage structures for port reuse. Hence, evaluation focused on both the largest and most conveniently located warehouses.

The throughput capacity indicated as a result of the modeling would be considered average by industry standards. A very busy warehousing facility will often operate at about 40,000 tons per storage acre per year. Since Guam can expect less activity (at least in the short term) than the world's most active ports, the turnover capacity will likely be much smaller and, therefore, stored material will probably remain stationary for longer periods of time. Consequently, it is not likely that Guam would achieve the projected operating capacity of over 18,600 tons per storage acre per year.

8 Reuse of the FISC

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8 Reuse of the FISC

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8.2.1 FISC Warehousing Capacity

Figure 8.2 identifies the main FISC warehouses which would be made available to a independent contractor upon privatization. The total square footage of the available warehousing is approximately 861,000 square feet (20 acres). The operating throughput capacity for these FISC warehouses is calculated to be a little over 368,000 short tons per year or 18,600 tons per acre per year. Details of the model are shown in Table 8.1. Although there are other structures throughout the area, the warehouses identified in Figure 8.1 and listed on Table 8.1 represent the most valuable storage structures for port reuse. Hence, evaluation focused on both the largest and most conveniently located warehouses.

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8 Reuse of the FISC

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BLDG NO. 3169
TANGO WHARF (1,495')
FISC BLDG NO. 2116
UNIFORM WHARF (1,219')
FISC BLDG NO. 2118
BLDG NO. 3187
BLDG NO. 3186
FISC BLDG NO. 3179
NAVY SEALS
BLDG NO. 3180
VICTOR WHARF (3,465')
COAST GUARD (400')
BLDG NO 6009
MAIN GATE
BLDG NO. 780
FISC/X-RAY WHARF (1,476')
BLDG NO. 3202
BLDG NO. 3201

INNER APRA HARBOR

FISC
NAVACTS
U S COAST GUARD
ABO COVE
PWC

EXISTING STRUCTURES
PROPOSED STRUCTURES

NORTH

0' 300' 600' 900'
SCALE: 1" = 600'

FIG8-2 09/26/96 10:52 FINAL

Figure 8.2

GP
ASSOCIATES, INC.
Engineers/Architects

Implementation

9

9 Implementation

9.1 Operational Considerations

An important implementation consideration is the type of entity that will operate each of the facilities turned over by the Navy to the LRA for reuse. The range of operator options is very broad. The options include operation by an existing or a newly created entity within the Government of Guam. Even within this option, there are further decisions available concerning performance of the work with government workers, or outsourcing all or part of the operations of the government facility to the private sector.

There are also numerous alternatives related to operations run by the private sector. Local Guamanian companies will be the preferred choice for many of the potential reuses contemplated and opportunities for local businesses will be an important consideration in selecting among reuse options.

In some instances, however, an operator from outside Guam's business community will be the most appropriate. This may occur when operations are specialized, requiring extensive experience to attract the needed level of business and to successfully convert a government facility to a commercial venture. These opportunities will often result in joint venture opportunities for local companies with the stateside or foreign companies. Extensive local subcontracting is usually used by these ventures, adding further work for local businesses.

Access to capital needed to convert the closing facilities will also be a consideration. Even for facilities that are traditionally government-built, owned, and operated, there are recent instances where the private sector is now centrally involved. Toll roads and marine terminals are two of the examples where commercial ventures are now performing traditional government functions in many countries, including the United States. Knowledge of the market and special connections to potential clients and customers are also important issues to review for each selected reuse, when considering the proper operating entity.

Specific operational considerations are a function of the reuse option selected.

- SRF Area. Alternative considerations for the SRF were discussed in detail in Section 7.2.5. Fundamentally, the Local Reuse Authority should actively investigate the potential for a joint venture between a Taiwanese (or other Asian) entity and a local Guamanian industrial firm to operate a privately-owned ship re-

pair/light industrial manufacturing facility. The joint-venture would capitalize on the potential market draw of an Asian firm for the Foreign Military Sales program. Guam, in turn, would benefit by developing a solid local business entity with stronger local ties and concerns; and, most importantly, such a structure would appear to have the greatest prospects for attracting workload, maximizing local job preservation and growth, and expanding the local economic development.

In the long-term, regardless of the success of the ship repair business, other alternatives, particularly those that are water-dependent, such as a transshipment container yard, appear attractive for mixed use of the SRF area. Such considerations suggest that for the long term, Guam should keep its options open with respect to the use of the 50 to 100 acres that are not needed for a full-service and privatized ship repair facility. Should future events and effective marketing result in a positive outlook for Guam to transform itself into a major transshipment center, then the northern edge of the SRF area could prove ideal. Should transshipment capabilities be not realized, the area could serve as a new Port headquarters and administration area with a control tower for the Harbor Master. Operationally, the specific reuse function that is ultimately realized, will drive its structure. Transshipment facilities are typically developed through private capital investment funds generated by shipping consortiums between local and long haul lines. Guam would be best served through such a mechanism, stimulated with Government economic incentives. Once developed, the facility would be operated by a private entity.

- FISC. Although the FISC is to be retained by the Navy, an operational alternative—privatization-in-place—was presented in Section 8.1. Privatization-in-place (PIP) offers major advantages towards the economic development of Guam. A private operator of the FISC would have the incentive to facilitate shared use possibilities; a broader customer base would serve to distribute fixed overhead costs and lower charges, making the facility more competitive and maximizing profits. Furthermore, the private operation of the FISC can have a synergistic effect with other redevelopment initiatives for Guam's harbor facilities. The cumulative effect of these efforts will be to retain and attract workload to Guam, resulting in higher levels of port employment. Additionally, if future Navy operations decline, if a PIP is operational, the community would have a head start on developing the economic activity needed to offset the loss of Navy business.

- NAVACTS. The NAVACTS areas presents intriguing opportunities for maximizing opportunities for private or private-Government partnerships in its development and operation. Because of the variety of reuse functions, the area would be financed and operated in an equally diverse manner.

9 Implementation

In the immediate future, development would likely focus upon a new fishery facility at the southern end of Victor Wharf. One intriguing development scenario for that area is for the Guam to renegotiate the terms of the Cabras Island Industrial Park development. At present, the agreement calls for the developer to construct warehousing, storage, administrative, and other facilities at the eastern end of Cabras Island, where the Port Authority of Guam and its commercial port are located. In lieu of developing that area, some (or all) of the intended development could be swapped for developing Victor Wharf—including the fishing terminal. Once developed, the facilities would be leased to the various users—fish trading companies, dinner cruise operators, passenger cruise agents, warehousers, and others—by the developer.

As for the Drum Lot area, several private businesses have expressed a specific interest in developing portions of it for their use. There appears to be sufficient interest to initiate the development of a privately-funded and operated industrial mall, and once operations begin, other firms are likely to capitalize on the likely synergy of collocating their activities.

9.2 Licensing and Interim Leasing

9.2.1 License

A license can be defined as: "A personal privilege to do some particular act or series of acts on land without possessing any estate interest therein, and is ordinarily revocable at the will of the licensor and is not assignable."

The use of a license to gain access to military facilities is governed by standard Military Department procedures. A license is normally used to grant property access when continued use is envisioned, versus more limited property access devices such as permits and rights-of-entry. Although a license is not normally considered as a base reuse mechanism, in certain limited circumstances, it can be a valuable tool as an short term reuse mechanism.

9.2.1.1 Summary of Standard License Terms. The prospective usefulness of a license can be ascertained through a summary of the standard terms from a license agreement for the use of military facilities. The key terms include:

- *Scope*: A license allows the licensee to use the property only for authorized purposes

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- *Term*: A license has a limited duration and is revocable at will.
- *Improvements*: A licensee cannot modify a facility without permission.
- *Payment*: A licensee normally makes a payment for use, utilities, and upkeep of the property.
- *Protection of the Property*: A licensee agrees to protect and maintain the premises and is responsible for damages caused by use of the property.
- *Insurance*: A licensee accepts liability for any damages and must provide proof of sufficient insurance.
- *Indemnity*: A licensee must indemnify and hold harmless the United States.

9.2.1.2 Advantages and Disadvantages of a License. The primary advantage of a license is that it can offer a relatively quick and easy mechanism through which local authorities and/or prospective tenant businesses can gain early access to military installation property. Military Departments most often use licenses for shared, non-possessory use of property, primarily for uses which are very similar to ongoing government uses, e.g., shared use of a dock. Therefore, in a situation where a parcel of property is not yet available for interim transfer on an exclusive basis, but has additional capacity for non-military uses, a license is an option.

The primary disadvantage of a license is that it offers a weak foundation for attracting any business involvement or investment at a site. The fact that a license can be revoked without notice at any time is a strong disincentive to an entrepreneur. Additional complications arise when a prospective private sector licensee needs to make minor modifications to adapt the site for its operations. Even aside from the risk of having this investment lost if a license is revoked, changes to the site are not normally allowed under a standard license. The resulting complication and delays in seeking approval, could eliminate the advantage of speed and simplicity a license may appear to offer over an interim lease.

Licensing can be used in conjunction with interim leasing. A license may prove useful in providing access to a property while a pending lease is being finalized. This use of licensing could be helpful, for example, when the lessee wants to begin early preparation of the site for its ultimate use, such as installing equipment prior to the lease finalization. However, the Military Departments are not permitted to use licenses as a substitute for an interim lease. Therefore, in this example, the licensee could not begin operations at the

site prior to lease finalization. A license is normally not approved in a base reuse context if it involves an exclusive grant of possession over DoD property.

9.2.1.3 Process for Obtaining a License. The Military Departments use standard application forms for licenses. The application is submitted to the base commander for consideration.

9.2.2 Interim Leasing

An interim lease is a short-term lease that makes no commitment to the lessee for future use or conveyance of title to the lessee upon its disposal. The interim lease may be contrasted with a "lease in furtherance of a conveyance" which does carry with it, a commitment for ultimate transfer of title.

Interim leasing of property at a closing military installation can help spur early economic development and job creation that can mitigate the painful transition between base closure and local control. Although DoD policy supports early interim leasing and timely review of interim leasing requests, certain environmental requirements must be met. These include the completion of an Environmental Baseline Survey (as compared the requirements of the full NEPA—National Environmental Policy Act—process) and a formal Finding of Suitability to Lease (FOSL).

9.2.2.1 Summary of Standard Interim Lease Terms. Comparison of the standard provisions of an interim lease with those of a license shows that the opportunities for productive economic short term use are far greater under an interim lease. Key terms include:

- *Scope*: An interim lease must state the approved purposes and uses. Although an interim lease can offer broad latitude in this area, the Military Departments will consider various site-specific factors in determining the scope of an interim lease and any accompanying restrictions.

- *Term*: Prior to June 1996, guidance for interim leases specified that they could last up to five years, including options to renew, subject only to a finding that the short term use is in conflict with NEPA or a national emergency requiring use of the facility. On June 12, 1996, however, the Principal Assistant Deputy Under Secretary of Defense (Industrial Affairs and Installations) issued guidance with respect to "Interim Leases of Property at Bases Approved for Closure or Realign-

ment." The guidance proposed to implement changes to Section 2833 of the National Defense Authorization Act ("Act") for FY96. The change allows the Secretary of the Navy to authorize longer interim leases, e.g., 20 years. While the term of years has changed, thereby increasing the likelihood that a potential investor will be more willing to make a necessary investment, certain limitations still do exist. For example, interim leases are still not authorized if the proposed activity "will either significantly affect the quality of the human environment or make impossible the selection of any reasonable final disposal alternative."

- *Improvements*: In the same action discussed above, the Principal Assistant Deputy Under Secretary of Defense issued guidance that also "permits building modification, demolition, and new construction, if such activities can be supported by an environmental assessment and finding of no significant impact (EA/FONSI), and do not preclude the selection of any reasonable final disposal alternative." While the approval of the interim lease and whether the proposed activities are permissible is to be made by the Navy, the Navy is specifically directed to deny leases that would "(a) irreversibly alter buildings integral to any reasonable final disposal alternative so to make them unusable for any purpose under active consideration; or (b) construct new, permanent structures on areas of the installation presently set aside for recreational purposes or preserved as natural or open space." Basically, if the use contemplated is similar to the current use, this change does offer substantially greater flexibility. However, obtaining an interim lease that will permit activities that would effectively change the land would be highly questionable.

- *Payment*: Although "fair market rental" is the standard (absent a public benefit discounted rental), the rent is considered in light of the terms of the lease and the restrictions on the property and public interest benefits. In addition, in some circumstances, it is possible to offset for maintenance, protection, repair, improvement, and restoration. The interim lessee also has responsibility for utilities and local taxes.

- *Protection of the Property*: An interim lessee also agrees to protect and maintain the premises and is responsible for damages caused by use of the property (although in most cases, the LRA will ultimately be acquiring the property anyway).

- *Insurance*: An interim lessee accepts liability for any damages. The interim lessee is also required to have property insurance on government-owned improvements and liability insurance coverage. Some exceptions exist for qualified government entities.

- *Indemnity*: An interim lessee must indemnify and hold harmless the United States for all claims arising out of the use of the property. If significant subleasing occurs, the interim lessee will want to consider those risks carefully.

- *Subleasing*: An interim lessee cannot assign or transfer the lease, or sublease any part of the property, without the approval of the Military Department. The sublease must be consistent with the prime lease, although the payment provisions can differ based on what the interim lessee can negotiate.

  The LRA will be required to adhere to the following guidelines in executing any sublease:

  - The term of the sublease cannot be longer than the term of the prime lease;
  - The sublease will contain provisions reinforcing that such leases do not convey any right or expectation on the part of the interim user to acquire the leased property from the Navy;
  - The provisions of the sublease must be consistent with the provisions of the prime lease and must contain all environmental provisions included in the prime lease;
  - The rental value is negotiated between the LRA and the sublessee; and
  - Rents will be applied to the protection, maintenance, repair, improvement, and other costs related to the leased property.

- *Environment*: Interim leases can be expected to contain lengthy and detailed provisions with respect to environmental protection measures. The scope of environmental analysis performed to support of interim leasing is limited to an assessment of those activities authorized under the lease, and the cumulative impacts of other past, present, and reasonably foreseeable future actions during the period of the proposed lease. This permits an expeditious consideration of NEPA requirements by focusing necessary analysis on lease activities, not disposal and reuse issues.

9.2.2.2 Advantages and Disadvantages of an Interim Lease. An interim lease offers advantages for all sides when properly implemented. Waiting for total base closure to begin reuse activities ignores the lengthy nature of the business recruiting process and ignores the employees who are laid off during the drawdown process. Further, allowing a trained workforce to dissipate makes it difficult to attract prospective new employers later.

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From the military perspective, the sooner the property is turned over to the LRA and its sublessees, the lower its property caretaker expenses during the transition period.

Normally, the LRA will have a strong incentive to seek interim leasing. Most case histories of successful base reuses involve the early recruitment of a key anchor business that helps give the overall project an aura of success. Sometimes that anchor results from the prompt transitioning of existing military workload to the private sector. It is far easier to recruit companies based on immediate prospects of economically beneficial operations that with prospects that are years into the future.

The LRA may choose to acquire promising property at an early stage, even if reuse prospects are not imminent. The considerations of undertaking such an action is discussed below. In all cases, the LRA who assumes the risks will want to have a broadly worded description of authorized purposes and uses for the leased property.

In terms of compensation, a LRA can usually find and articulate numerous grounds to justify a lower than fair market rate due to public interest criteria. These criteria range from actual public benefit uses of the property to job creation and economic development to the protection and preservation of the property itself. The LRA may (but is not obligated to) pass these benefits through to prospective tenants, aiding in the recruitment process.

One drawback of an interim lease can be the length of time required to allow completion of the EBS/FOSL process. Those LRAs who aggressively seek to maximize their potential to enact a proactive reuse schedule, often want an interim lease prior to its actual availability. In these cases, the preparation of the lease application and negotiation over the lease terms can occur concurrently with the EBS/FOSL process. Accordingly, absent any surprising environmental findings, a community can often obtain an interim lease without undue delay after an affirmative decision to seek the lease is made.

An interim lease suffers some of the same drawbacks as a license, only to a lesser extent. Even though a twenty year lease is possible, interim leases will generally terminate at the time that final reuse and disposal decisions are reached. Therefore, any business making a significant investment in a base operation will often need further written assurances. Another drawback is that the standard interim lease language requires that any improvements made to the property by the lessee be either removed and the property restored at the end of the lease term or, if the Military Department decides to accept the improvements, to become the property of the United States without compensation to the lessee. This provision is a significant disincentive towards making any improvements, despite the fact that some military facilities are indeed in need of renovation.

On the other hand, even if a sublessee could economically justify property improvements, such improvements cannot either trigger the need for an EIS or irrevocably commit the property to a particular course of reuse. Therefore, most improvements to property do involve renovation and repair, not new construction. When funding is available, LRAs have found such improvements to be advantageous for business recruitment, and they can sometimes recoup the costs directly or indirectly.

Another factor to consider is that the Military Departments often prefer to grant one overall interim lease for all available property instead of many multiple leases geared to specific (and often separate) facility opportunities as they arise. The favored procedure results in less administrative work for the Military Department, and it encourages local assumption of property responsibilities (and expenses) for more property at an earlier date. In negotiating such an interim lease, the LRA can use a broader assumption of caretaker responsibilities as a basis for lower payments under the interim lease. Further, when properly tailored, an interim lease that anticipates upcoming demands can provide for quicker property access for potential, but as yet unidentified. tenants. These concerns should be carefully considered prior to applying for and negotiating an interim lease.

9.2.2.3 Process for Obtaining an Interim Lease. As an outgrowth of the BRAC process, the application form and regulations for interim leases have been standardized across all the Military Departments. However, although all of the services have gained more experience with interim leasing, some variance exists in the length of time and ease of approval. Fortunately, the Department of the Navy has a deserved reputation for being one of the more capable and cooperative services.

As stated previously, the primary prerequisite for applying for an interim lease is the completion of the EBS/FOSL process. Generally, the Military Departments will only accept expressions of interest in an interim lease from the LRA. Upon receipt of a request for an interim lease, the Military Department will consult with the local installation commander to gain concurrence that the facility is available and the short term use would be compatible with ongoing missions. Subsequently, the Military Department will meet with LRA representative(s) to discuss the leasing process and issues pertaining to the scope of the proposed short term reuse.

The actual approval process for an interim lease can vary widely based on the complexity and likely impact of the proposed short term uses, as well as the need to obtain supplementary information to accompany the interim lease application. Some of these factors are discussed in more detail in the next section on recommendations for implementation of interim leasing with respect to specific facilities.

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9.2.3 Recommendations

In analyzing the suitability of seeking interim property access to any of the Guam facilities, a variety of factors should be evaluated. Among the principal questions to be answered are the following:

- Based on the base transition plan and operational concerns, is this facility available for short term reuse?
- If the facility is (or will become) available, does it present the opportunity for immediate commercial use?
- If the site does not have an immediate commercial use, is the site attractive enough from a business standpoint to warrant assumption of financial responsibilities based on available prospects?
- Can the proposed purposes and uses be implemented without any site improvements that could pose problems from environmental, financial, or reuse perspectives?
- Can the short term use of the property be accomplished without affecting the viability of long-term reuses?

Obviously, any conclusions reached at this point require serious qualification. The attractiveness of any agreement could change upon a more detailed determination of the financial projections the ultimate terms negotiated with the Department of the Navy. Having made these disclaimers, however, the recommendations below are based on our best professional judgment.

Generally speaking, the precarious, revocable-at-will nature of the license makes it a problematic foundation for even short-term business decisions. Therefore, absent a particular and compelling need for an expedited bridging action with regard to a prospective business tenant, the need for stability argues for the use of an interim lease as the sole property access mechanism. Further, we have every expectation of prompt consideration of interim lease requests based on the continuing dialogue we have maintained with the Navy.

9.2.3.1 Recommendation for Drum Lot at Polaris Point. The Drum Lot at Polaris Point should be a candidate for interim leasing. The area is unused and the proposed reuse as an industrial mall fully supports the long-term land use plan. Because the proposed short term reuse is identical to the approved long range land use plan prospective businesses should find the area attractive even though some facility investments would be needed. For the most part, however, the building requirements are likely to be satisfied by prefabricated metal warehouse-type structures with limited life spans. The analysis shows that all necessary utility lines are in place to support the industrial mall.

The proposed reuse activity is projected to have an immediate positive impact on Guam's economy by stimulating purchases, attracting compatible businesses, providing employment, and boosting the Territory's tax base.

Recommendation. Application should be made for interim leasing of the Drum Lot for reuse as an industrial mall. Preparation of the application and dialogue with the appropriate Navy officials should commence in an expeditious manner to make progress during the EBS/FOSL process and pave the way to "fast-track" the application.

9.2.3.2 Recommendation for Victor Wharf. Victor Wharf appears to be a good candidate for interim leasing for a variety of reasons. First, conversations with a variety of officials in the Department of the Navy, as well as with the Coast Guard, indicate that the facility is not only available, but also that continuing uses in the area can be accommodated in a feasible reuse plan. In addition, it appears that necessary repairs to the facilities and infrastructures needed for short-term commercial uses have been substantially completed.

Second, Victor Wharf has certain prospects for immediate commercial use that could justify interim leasing possibilities. As described earlier in Section 6 of this plan, these prospects include the use of Victor wharf for fishing facilities, passenger/cruise facilities, local excursion facilities, and Break Bulk terminals. These uses could be accomplished without significant additional infrastructure, although certain improvements will be required to realize the full long-term prospects of the property. Further, both the scope of the interim lease and the prospects for these short-term uses could be enhanced if relocation of the SEALS is accomplished in a timely manner. Finally, if planned properly, these short-term uses will not hinder longer-term plans for Victor Wharf.

Recommendation. Application should be made for interim leasing of a substantial portion of Victor Wharf. Preparation of the application and on-going dialogue with the

appropriate Navy officials should continue in an expeditious manner to make progress during the EBS/FOSL process and pave the way to "fast-track" the application.

9.3 Financial Considerations

Once the reuse options have been assessed and a plan determined, then specific financial considerations can be thoroughly reviewed. Initially, this involves an evaluation of expected revenues—including income from lease payments, property sales, and added tax revenues.

Costs are then calculated. Costs can be categorized as capital costs and operating costs. Capital costs include the improvements that will need to be made to the properties to make them ready for the planned reuse. The largest portion of these costs are usually infrastructure modifications such as road and utility construction. Other costs may include building modifications or other minor construction. The cost of any required demolition will also be included in the required capital costs.

Operating costs include the operations and maintenance of the property and facilities after they are turned over by the Navy and before they are transferred to a governmental or commercial entity for their operations. Although the Navy will continue to pay these costs until the properties are ready for transfer or lease, once the properties become the community's responsibility, these costs must be paid by the community. They can be very substantial for major facilities like those on Guam. The military services sometimes contract for these services from the community as they near turnover dates of the properties. This allows the community to work through the transition period from military operations to local government or civilian operation in a more orderly manner. Another operating cost that must be considered is the cost of providing the staff and operating the redevelopment authority.

Time phasing of the capital costs is an important step in this analysis along with projected changes over time in the operations and maintenance expenses during the financial review period.

The expected revenues also need to be time phased in a very realistic manner. The market analysis must forecast the projected income stream. An overly optimistic revenue projection is likely to create an illusion that capital expenditures are needed or are financially acceptable sooner than justifiable. This could dramatically increase operating deficits. Capital costs need to be spent when they are needed to facilitate reuse, not before.

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This analysis will potentially lead to a determination of projected operating deficits, with costs exceeding revenues early in the reuse process. Adjusting the expenditure of capital improvement funds might reduce this deficit, but only if it does not significantly reduce the potential for revenue.

If the revised analysis still leaves a significant deficit, then alternate sources of revenue must be investigated.

9.4 Marketing Strategy

Bringing market realism to the reuse planning process is a key element of the marketing strategy. As each of the reuse areas are examined further, the market analysis related to these areas will continue. This analysis will provide insights into the needs of prospective facility users to assist in the preparation of final redevelopment plans that will be responsive to these organizations.

The continuing market reviews will focus on the general areas noted in Section 3.4—ship repair and other industrial uses, fishing, tourism, and other commercial facility needs, such as freight handling, storage, and forwarding. The work will not only provide information about specific needs, but also identify those businesses and organizations who might make use of the properties.

Guam's location requires a very wide geographic scope and sophistication in its marketing efforts. While primary focus will be on local, Guamanian firms, the large size and complexity of some of the reuse properties will require broadening to include stateside companies as well as those from East Asia and other parts of the Pacific basin.

The reuse areas must be redeveloped in a manner that creates properties that are responsive to the needs of the firms in the target industries. This includes creating real estate that meets the client's physical requirements including size, location, amenities, and related infrastructure requirements. It also means that the properties must be cost competitive and available under terms that are attractive. Collection of these insights will be part of the marketing strategy.

Materials will be prepared that present the strengths and advantages of the reuse properties for each intended reuse. These can be used when making contact with potential users identified in the market analysis. Any marketing and sales contacts that are undertaken with potential clients must be carefully coordinated between the marketing agent and the LRA.

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9.5 Organization and Responsibilities

As the designated Local Redevelopment Authority, GEDA will have continuing overall responsibility for completion of the reuse plan and its implementation. Nothing has yet been identified which would cause a change in this determination. However, as the specific requirements of the selected redevelopment planning activities become better defined, a continuing assessment should be made to determine if there are requirements or advantages to having other entities directly participating in specific elements of the implementation.

For example, at the present time we expect that GEDA will be able to meet the terms and conditions that may be required by the Navy for leasing and licensing of excess properties. Although, after actual negotiations with the Navy begin, it may become advantageous to have a different entity lease or license the property.

Other Guam governmental entities, though they may not be receiving leases directly from the Navy, will be involved in implementing portions of the reuse plan. For example, in the draft interim lease of Victor Wharf, the Port Authority of Guam is identified as a proposed sublessee. The Port Authority would in turn sublease portions of the wharf to various users.

During the transition between Navy and Guam ownership, there will be a transfer of responsibility for providing municipal-type services, including substantial amounts of caretaker activities. In some base closures, this has occurred well before the actual signing of the lease or transfer of the property, with local, private businesses contracting with the military service to perform them while the base is transitioning from Navy operations to private operations. This often occurs in the critical and often difficult area of utilities. It is expected that Guam's public works agencies will have responsibilities for implementing this transition.

Properties transferred through an Economic Development Conveyance (EDC) can only be transferred to an LRA that has been recognized by the Office of Economic Adjustment. An element of the Navy's review of an EDC application is whether the LRA is authorized to acquire and dispose of the property. They are also required to make an assessment of the LRA's ability to implement the reuse plan, particularly in view of the level of investment required. We know of no reason to anticipate the requirement for a different entity to be the recipient of the property. However, if it is determined that a different entity is advantageous to Guam, then the regulations do allow for a change. Several communities have used this option because of the creation of new entities with specific bonding authority that was needed to finance redevelopment expenses.

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9.6 Estimated Timetable

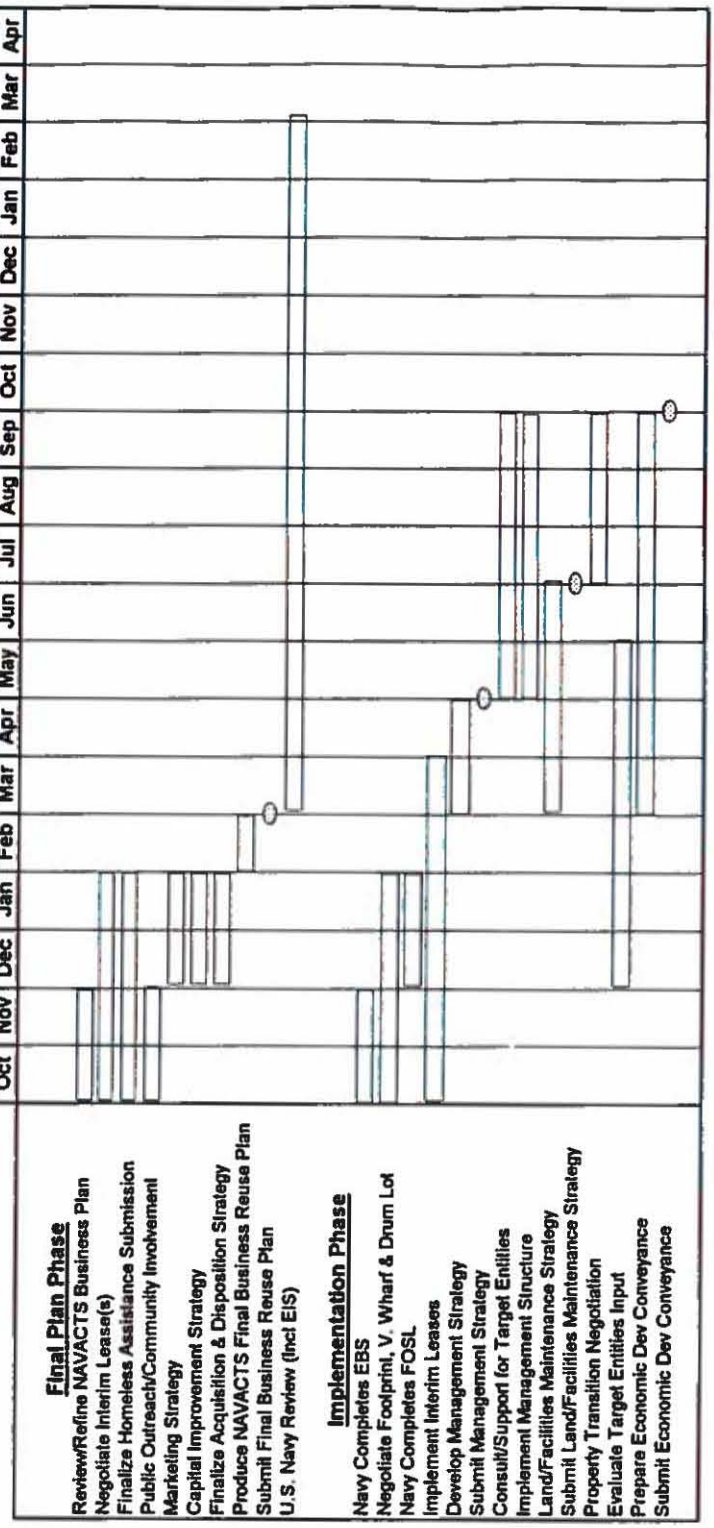
The series of steps necessary to implement a privatization-in-place initiative, to include the process of securing Navy approval and the competitive contractor selection process for reuse of the FISC was discussed in Section 8.1.6 and graphically portrayed in Figure 8.1.

While the process is fraught with uncertainty, and all estimates of time are contingent upon the occurrence or non-occurrence of both dependent and independent events, conceptual sequence of events for the redevelopment of the NAVACTS and SRF areas have also been developed. Each of the areas require concurrent execution of two broad functions—finalization of this draft reuse plan and implementation of the plan. The underlying tasks behind these necessary steps are graphically portrayed in Figures 9.1 and 9.2, respectively.

We look forward to working with the LRA, the Navy, and the public in carrying the alternatives outlined in this draft plan to the next phase.

9 Implementation

Figure 9.1
NAVACTS Redevelopment Work Plan



9 Implementation

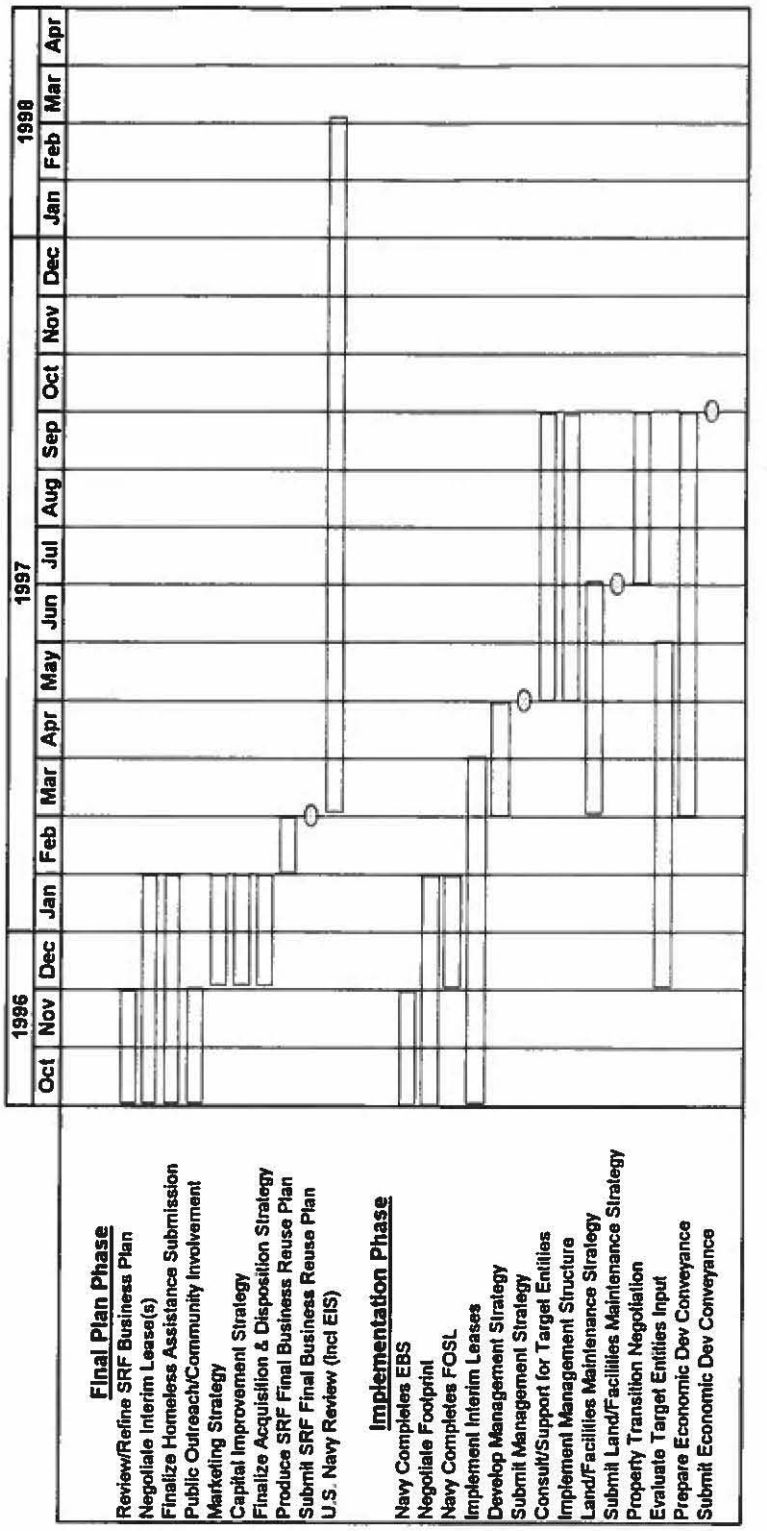


Figure 9.2
SRF Redevelopment Work Plan

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Appendix A

Nine Point Vision Statement

Appendix A
Nine-Point Vision

Apra Harbor Development Needs
Position Paper

Vision for Apra Harbor

Redevelop portions of the naval base for best and highest use, integrating its facilities and functions with those of the Commercial Port and Guam's business community. Revitalize these assets to diversify products and services; stimulate the economy to generate new capital, retain critical skills, and promote the creation of a variety of new employment opportunities; provide for the homeless; increase recreational and leisure opportunities; and advance tourism.

Basis for Negotiations

Realizing the vision requires attainment of the following nine objectives. As Guam negotiates for the release of BRAC 95 properties, attention will focus on assets that are requisite to their fulfillment. Guam's long-term economic vitality will be greatly influenced, and perhaps even determined, by the degree of success it achieves in negotiating the release of these specific assets.

Objective 1: Wharfage and Acreage for a Full-Service Fishing Port

Requirement: (a) Wharf frontage for offloading fish catches and taking on voyage supplies. (b) Facilities and open space adjacent to the fishing wharf for bait storage, ice plant, packing plant, salt storage, ship supplies, fisherman's storage. (c) Expeditious completion of the environmental baseline survey (EBS) to facilitate the early lease of properties prior to deed transfer. (d) Completion of clean-up plans and mitigation consistent with final reuse.

Appendix A
Nine-Point Vision

Discussion: Currently, long-liners discharge their cargo at wharves F-3 and F-4, competing for wharf space with container ships, Break Bulk cargo, and sometimes cruise ships. Fishing boats are frequently tied-up three or more abreast because of congestion and dock shortage. Purse seiners call on Hotel wharf when maintenance is required. This same wharf is used normally by Guam's dinner cruise industry. A small fenced in area adjacent to the Hotel wharf provides a rudimentary facility for net repairs and maintenance.

The existing facilities are inadequate to meet current demands, and clearly restrain the growth of Guam's fishing industry to its full potential. Without acquisition of wharves and facilities currently used by the Navy, Guam's fishing industry cannot sustain the dramatic increase in transshipments that has been realized since 1986. While the region has the potential for supporting 1,000 or more long-liners and an equivalent increase in the number of purse seiners, such growth can occur only if Guam can develop port infrastructures to service their needs.

Acquisition of Victor wharf will allow Guam to develop a full-service capability to offload fish, onload voyage supplies including ice, salt, and provisions, and to facilitate the efficient packing of offloaded fish for air transshipment to Tokyo and the Japanese consumer market.

Objective 2: Facilities to Support Increased Cruise Ship Arrivals

Requirement: (a) Immediate licensing, and later deed transfer of wharf frontage for accommodating cruise ships. (b) Construction of landside facilities to facilitate bus access and land tours. (c) Expeditious completion of the EBS to facilitate the early lease of properties prior to deed transfer. (d) Completion of clean-up plans and mitigation consistent with final reuse.

Discussion: About 15 separate international passenger ships call on Guam an average of twice a year for a total of approximately 30 cruise ship visits per year. While the numbers of cruise ship

passengers have been sporadic, it appears to be recovering from the low in 1993.

One reason for the sporadic nature of passenger travel may be the total lack of passenger support facilities within the Commercial Port. Presently, cruise ships dock at Hotel wharf or sometimes, at wharves F-3 and F-4. Hotel wharf is an open concrete dock with no permanent structure—clearly, unacceptable as an international tourist arrival point. The primary function of wharves F-3 and F-4 is to discharge and load containerized cargo.

For Guam to maintain cruise travel interests and expand to its full potential, modern land-side support structures are needed. Tango, Uniform, and/or Victor wharves are ideally suited as it is close to the ground transportation needed to transport guests to tourist attractions and accommodations.

Objective 3: Ship Repair Facilities and Industrial Yards

Requirement: (a) Closure and fee simple deed transfer of the naval ship repair facility (SRF) for conversion into a maintenance and repair facility to support industrial and light manufacturing functions. (b) Long-term maintenance agreement for servicing all boats that will remain assigned to NAVACTS. (c) Opportunity to service Military Sealift Command (MSC) ships, particularly if the Navy elects to continue their forward deployment in Guam. (d) Sustain current employment levels. (e) Expeditious completion of the EBS to facilitate the early lease of properties prior to deed transfer. (f) Completion of clean-up plans and mitigation consistent with final reuse.

Discussion: Upon closure of the SRF in September 1997, over 450 civilian positions will be eliminated. These employees possess skills and qualifications that are not duplicated elsewhere in Guam, nor in Micronesia or the western Pacific. Loss of these skilled workers will preclude Guam from achieving its goal of diversifying its sustainable economic base.

Appendix A
Nine-Point Vision

Guam intends to maintain its residents' skills and specifically, ship repair capabilities, through privatization of the SRF. Privatization will allow Guam to continue to provide service to the Navy in maintaining its small fleet of boats assigned to Guam, as well as to service MSC ships that are likely to remain forward deployed to Guam. Privatization will also allow Guam to initiate maritime support services to the expanding fishing fleet and small recreational boats, as well as providing such emergent repairs as may be needed for the regularly traversing container, Break Bulk, and passenger ships. Moreover, privatization will allow Guam's commercial business concerns to diversify repair and overhaul services to industries beyond the maritime trade. The SRF's one-of-a-kind foundry, motor rewind facility, and environmentally-controlled painting and corrosion control facility are unique assets that must be economically exploited.

Guam further intends to capitalize on the availability of SRF assets by developing a skilled vocational training educational system focused on the SRF facilities. Guam envisions a Micronesian center of excellence that would train tomorrow's workers throughout the western Pacific.

Objective 4: Warehousing and Open Storage Areas

Requirement: Fee simple transfer and privatization of existing FISC warehousing operations so private commercial enterprises can support navy needs as well as the private sector. Establish the Navy as a long-term customer. Expeditious completion of the EBS to facilitate the early lease of properties prior to deed transfer. Completion of clean-up plans and mitigation consistent with final reuse.

Discussion: Currently, the FISC services only the needs of the U.S. Navy. Although a substantial amount of warehousing space, wharf frontage, and open storage areas are set-aside for its operations, for all practical purposes, none of it directly benefits the Guam commercial trade.

Appendix A
Nine-Point Vision

Guam believes that increased capability to manage and control supplies and Break Bulk commodities is crucial in its efforts to sustain the present economic recovery. Having experienced first-hand the realities of reliance on limited revenue sources—primarily tourism—Guam recognizes the pressing need to diversify its tax base and income structure.

Privatization of the FISC operations with private businesses providing services to both the Navy and the private sector results in a win-win situation. The Navy receives its needed supplies at competitive market rates while Guam realizes a diversification of its economic structure. Excess warehouse space and unused open spaces within the FISC area can be exploited by entrepreneurs to ease Guam's critical shortage of commercial warehouse space. Warehousing operations that are currently dispersed throughout the island can also be consolidated in a more efficient and effective arrangement.

Objective 5: Acreage for Commercial Retail Facilities

Requirement: Acreage/open space adjacent to cruise ship/dinner cruise wharf(s) for the development of a commercial and retail center to service passenger cruise travelers and dinner cruise guests. Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

Discussion: Relocation of cruise ship berthing to the inner harbor provides Guam an opportunity to further promote cruise and recreational ocean travel. Using lands adjacent and inland of the new cruise ship terminus, Guam intends to construct a new commercial retail center directed primarily (but not solely) towards inbound and outbound passengers.

Conceptually, Guam envisions a complex similar, but not identical in scope or size, to *Aloha Tower Market Place* in Honolulu, *Seaport Village* in San Diego, and *Fisherman's Wharf* in San Francisco. Guam intends to create its own version of a port-of-call, taking successful themes from others and

adapting them to meet the specific needs of Guam. The proximity of the fishing fleet (now also within the inner harbor) will certainly be a factor that will be capitalized upon.

Objective 6: Facilities to Promote Tourism

Requirement: Transfer of all lands/facilities on Drydock Island (except for fuel point needs) to allow the development of a tourist-oriented theme park complex, recreational facilities, and preservation of conservation areas. Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

Discussion: Tourist arrivals is expected to rise to nearly 2 million by the year 2000. Guam's prime tourist destination, Tumon Bay, is virtually at capacity. Tourists are increasingly seeking activities beyond the Tumon locale.

To continue the enhancement and expansion of activities and attractions for tourists, Guam is considering several alternatives for the development of a new theme park on Drydock Point. Guam's typical tourist from Asia is an activity-oriented visitor and expects an abundance of active recreational opportunities. Drydock Point has the potential for offering a variety of water-related recreation services including swimming, boating, diving, and snorkeling, as well as land-based park facilities. The area has an added bonus in that it is adjacent to existing conservation areas. Guam intends to fully preserve these wetlands and marine sanctuaries and integrate them into the proposed tourist-related facilities.

Objective 7: Expanded Recreational Opportunities to Improve the Quality of Life

Requirement: Transfer of the Sumay Cove marina for joint-use as a small boat marina. Joint-use of Orote Point for selected recreational purposes.

Discussion: Two marinas service small boat owners in Guam—Agana Marina and Agat Marina. Waiting lists for boat slips are the rule. Neither of the harbors are as well-protected from high waves as the Navy's recreation area in Sumay Cove.

Guam seeks transfer of the Sumay Cove marina for conversion as a joint-use marina. A third small-boat marina at Sumay will serve to immediately relieve the shortage of boat slips. Facility enhancements to the Sumay marina will benefit both Guam residents and U.S. Navy personnel.

Objective 8: Conservation Areas to Preserve the Environment

Requirement: Transfer of properties on Orote Point except that needed for naval housing and ammunition offloading to allow for joint recreational areas, restoration of historical sites, and tourist-related facilities that are compatible with the ESQD requirements of Kilo wharf. Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

Discussion: Although Guam recognizes that use of Orote Point must conform to safety requirements of ammunition activities, we nevertheless believe that the full potential and best use of land are not being presently realized. Additionally, while Orote Point is of significant historical importance in Guam's development, it remains inaccessible.

Guam seeks to rectify these shortcomings by increasing public use of Orote Point. Development will be limited. Consistent with ESQD requirements, Guam proposes to provide limited-scale joint recreational facilities, restoration and recognition of culturally significant sites, and provide tourist-related facilities where practical.

Appendix A
Nine-Point Vision

Objective 9: Housing for the Homeless

Requirement: Consider the use of selected excess navy lands for accommodating Guam's homeless. Completion of the EBS, clean-up plans, and mitigation consistent with final reuse.

Discussion: Although Guam's homeless population is not large, it does not have adequate nor permanent facilities for them. Release of excess naval properties provides the opportunity to correct the status quo. Guam intends to justify and aggressively pursue the conversion of selected facilities for use by the homeless.

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Appendix B

The Navy Footprint

Appendix B
The Navy Footprint

[Reproduction of a letter from Admiral D.L. Brewer, III, Commander U.S. Naval Forces Marianas, to Governor Carl T.C. Gutierrez, dated August 9, 1996]

The Honorable Carl T.C. Gutierrez
Governor of Guam
Office of the Governor
P.O. Box 2950
Agana, Guam 96910

Dear Governor Gutierrez:

On July 11, 1996, CAPT Humphreys-Sprague briefed the Executive Steering Committee on the Navy's BRAC 95 execution plan. She expressed our plan verbally and I wish to confirm it with this letter. The Navy's plan is based on three goals: (1) to minimize the infrastructure retained to that which is essential to support mission requirements; (2) to convey as much property as possible to Guam to stimulate economic growth; and (3) to ensure Navy's access to Guam port facilities in support of emergent and contingency requirements.

The briefing included the following points:

(1) Ship Repair Facility (SRF) Closure and Disposal: To assist Guam in their economic development of port facilities and land, the Navy will convey the SRF land, buildings, personal property, and wharves (Lima through Quebec) by title transfer to Guam for reuse upon satisfactory environmental clean-up. Navy will not guarantee any future ship repair work to Guam; however, if the maritime repair capability is available and quality work can be assured, the Navy would consider competitive bids on ship repairs. Navy is most interested in privatizing the following functions at SRF as quickly as possible:

- Chemical laboratory
- Calibration laboratory
- Hazmin/Hazmat storage
- Demineralized water production

Other licensing/leasing and joint use of the SRF facilities will be available to assist Guam in starting the reuse of these facilities.

(2) Explosive Safety Quantity Distance (ESQD) Impacts: Recognizing that the ESQD arc encumbrance of Polaris Point was a major obstacle to the reuse of SRF, the Commander in Chief of the Pacific Fleet (CINCPACFLT) directed that Alpha and Bravo wharves ordnance operations be conducted so as not to encumber SRF buildings and wharves

and the Submarine Tender Net Explosive Weight be limited when med-moored at Alpha Wharf.

(3) Recompression Chamber: The chamber and its associated equipment is considered mission essential for both the Naval Special Warfare Unit ONE (NSWU-1 "SEALS") and Explosive Ordnance Disposal (EOD) missions in the Western Pacific Region. The chamber, located in Building 21, and its associated properties located in the SRF dive locker and the maintenance functions in Building 20, will be relocated to Tango Wharf.

(4) Floating Drydocks: A decision is not forthcoming as to the final disposition of the floating drydocks. We are awaiting the Secretary of the Navy response to your letter, dated May 28, 1996, requesting a binding decision be placed on hold until such time as a revise[d] plan is submitted.

(5) Drydock Island: The possible excess and title transfer of Drydock Island to Guam is under review. The land will be transferred if Landing Craft Air Cushion (LCAC) exercises can be effectively conducted at Dadi Beach. Delta and Echo Wharves will be retained by the Navy, as will associated lands and the pipelines necessary to refueling and fuel storage operations.

(6) Uniform Wharf: The Navy will convey this wharf to Guam after those repairs required for public health and safety are made.

(7) Victor Wharf: This wharf and associated lands will be transferred to Guam, but will remain encumbered by the Coast Guard properties, including 400 linear foot of wharfage. The Coast Guard supports both military and civilian harbor usage. Its on-site location will be beneficial to Guam in monitoring custom issues at a commercialized Victor Wharf. Some additional land parcels adjacent to and west of Victor Wharf will be available for long term lease. Additionally, the Navy functions on the wharf, will be moved to other areas on Naval Activities to permit Guam's redevelopment of the wharf. No other repairs or modifications will be made to the wharf.

(8) Main Gate and Perimeter Fencing: The main Naval Activities gate will be moved to provide direct unrestricted civilian access to reuse areas via Sumay Drive. After the relocation of the perimeter fence, four Navy compounds will be outside the fenced Naval Activities area. They are:

(a) The Navy Exchange and Commissary activities, Autoport, McDonald's, as well as several other commercial activities (Military Car Sales and Auto Service Center).

(b) Active Navy sole use waterfront operations on Romeo, Sierra and Tango Wharves, as well as the Fleet Industrial Supply Center (FISC) and X-ray Wharf compound.

(c) The Defense Reutilization and Marketing Office (DRMO).

(d) Several PWC facilities including the sewage treatment plant, several storage warehouses, a transportation compound, operational areas for power generation, and the landfill.

(9) Polaris Point: This area will be retained with its associated wharves for the use of the USS FRANK CABLE and the Submarine Refit Site Guam in their mission and support of submarine repairs and operations. These missions are not compatible with civilian reuse.

(10) Orote Point: The Navy requires retention of Orote Point for ammunition-loading and combat training. The current ESQD arc encumbers the area totally when ammunition loading operations are conducted, precluding all economic development options for Orote Point. This is also a very high use area for combat training. Continued issuance of historic tour passes will allow access to these areas when ammunition operations or combat training do not encumber the Point.

(11) Fleet Industrial Supply Center (FISC) Properties: This command will be disestablished by September 30, 1997. Portions of the FISC property are being considered for commercialization, providing potential contract opportunities for local suppliers. Our current intentions and long range vision are a tailored logistics support facility to provide for a customer-base that includes three T-AFS ships (for a period of approximately 2-3 years, final decision pending); a Guam based submarine tender; and, those on-island functions where it makes economic sense to do so. Outsourcing of Guam logistics support is being reviewed as an on-going effort. CNO and CINCPACFLT are finalizing their positions on the Diego Garcia shuttle and T-AFS missions; we expect a decision within 60 days.

(12) Outlying Areas of Apra Heights: Four sub-areas at Apra Heights are no longer needed once Navy activities are relocated from those properties. The land and facilities will be excessed to the LRA. Relocation will be in late 1998.

(a) The contents of the jumbo quonsets in Apra Heights are being relocated and consolidated within existing warehouse assets.

(b) Building 4175, which now houses the Human Resources Office (HRO) and the Naval Legal Service Office (NLSO), will be accommodated within current facilities on Naval Activities.

(c) The Bachelor Quarters portion of Building 4175 will b excessed without replacement.

(d) The Naval Construction Forces (NCF) construction equipment (CESE) live storage building will no longer be needed once the equipment is relocated to Romeo Wharf. This facility is located adjacent to Camp Covington (GLUP Parcel 94 N15), and also near the future site of the PUAG Waste Water Treatment Plant in Apra Heights.

We will continue to work with you and the LRA to finalize the transfer and lease of these properties. Please refer your questions to Captain

Appendix B
The Navy Footprint

Mary Humphreys-Sprague, the Chief of Staff, or Commander Dave Willis, the BRAC 95 Base Transition Coordinator.

Sincerely and very respectfully,

[signed]

D.L. BREWER, III
Rear Admiral, U.S. Navy

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Appendix C

Estimated Costs, Terminal Modules

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

CONTAINER MODULE - WHEELED (82 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	82 3,571,920	AC SF	$5.00	$17,859,600	Construct New Backlands, etc. including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	2,200	LF	$10,000	$22,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	82	AC	$35,000	$2,870,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	82	AC	$30,000	$2,460,000	Includes SD/FW/DW/SS.
6	Yard Light Standards	24	EA	$50,000	$1,200,000	Assume 100' light poles
7	Gate Site Work	4 174,240	AC SF	$10	$1,742,400	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	3,000	SF	$75	$225,000	Canopies and/or Other Structures
9	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building
10	Maintenance & Repair Building	50,000	SF	$75	$3,750,000	M & R Building
SUB-TOTAL ALL TASKS					**$53,207,000**	
INCLUDE CONTINGENCY OF				15%	$7,981,050	
TOTAL CONSTRUCTION COST					$61,188,050	
TOTAL BUDGET ESTIMATE FOR CONTAINER TERMINAL (Rounded)					**$61,188,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE September 30, 1996

CONTAINER MODULE - RUBBER TIRED GANTRY (RTG)/WHEELED (82 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	82 3,571,920	AC SF	$6.50	$23,217,480	Construct New Backlands etc including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	2,200	LF	$10,000	$22,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc
4	Site Electrical	82	AC	$35,000	$2,870,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	82	AC	$30,000	$2,460,000	Includes SD/FW/DW/SS.
6	Yard Light Standards	24	EA	$50,000	$1,200,000	Assume 100' light poles
7	Gate Site Work	4 174,240	AC SF	$10	$1,742,400	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	3,000	SF	$75	$225,000	Canopies and/or Other Structures
9	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building
10	Maintenance & Repair Building	50,000	SF	$75	$3,750,000	M & R Building
SUB-TOTAL ALL TASKS					**$58,564,880**	
INCLUDE CONTINGENCY OF				15%	$8,784,732	
TOTAL CONSTRUCTION COST					$67,349,612	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$67,350,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

CONTAINER MODULE - FORKLIFT TRUCK (FLT)/WHEELED (82 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	82 3,571,920	AC SF	$5.50	$19,645,560	Construct New Backlands, etc. Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	2,200	LF	$10,000	$22,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	82	AC	$35,000	$2,870,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	82	AC	$30,000	$2,460,000	Includes SD/FW/DW/SS.
6	Yard Light Standards	24	EA	$50,000	$1,200,000	Assume 100' light poles
7	Gate Site Work	4 174,240	AC SF	$10	$1,742,400	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	3,000	SF	$75	$225,000	Canopies and/or Other Structures
9	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building
10	Maintenance & Repair Building	50,000	SF	$75	$3,750,000	M & R Building
SUB-TOTAL ALL TASKS					**$54,992,960**	
INCLUDE CONTINGENCY OF				15%	$8,248,944	
TOTAL CONSTRUCTION COST					$63,241,904	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$63,242,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

TRANSSHIPMENT MODULE - RTG AND WHEELED (55 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	55 2,395,800	AC SF	$5.50	$13,176,900	Construct New Backlands, etc. including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	1,600	LF	$10,000	$16,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	55	AC	$35,000	$1,925,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	55	AC	$30,000	$1,650,000	Includes SD/FW/DW/SS.
6	Yard Light Standards	24	EA	$50,000	$1,200,000	Assume 100' light poles
7	Gate Site Work	4 174,240	AC SF	$10	$1,742,400	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	3,000	SF	$75	$225,000	Canopies and/or Other Structures
9	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building
10	Maintenance & Repair Building	50,000	SF	$75	$3,750,000	M & R Building
SUB-TOTAL ALL TASKS					**$40,769,300**	
INCLUDE CONTINGENCY OF				15%	$6,115,395	
TOTAL CONSTRUCTION COST					$46,884,695	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$46,885,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

TRANSSHIPMENT MODULE - FLT AND WHEELED (55 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	55 2,395,800	AC SF	$5.50	$13,176,900	Construct New Backlands etc Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	1,600	LF	$10,000	$16,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	55	AC	$35,000	$1,925,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	55	AC	$30,000	$1,650,000	Includes SD/FW/DW/SS.
6	Yard Light Standards	24	EA	$50,000	$1,200,000	Assume 100' light poles
7	Gate Site Work	4 174,240	AC SF	$10	$1,742,400	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	3,000	SF	$75	$225,000	Canopies and/or Other Structures
9	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building
10	Maintenance & Repair Building	50,000	SF	$75	$3,750,000	M & R Building
SUB-TOTAL ALL TASKS					**$40,769,300**	
INCLUDE CONTINGENCY OF				15%	$6,115,395	
TOTAL CONSTRUCTION COST					$46,884,695	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$46,885,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate						
DATE: September 30, 1996						
GENERAL CARGO - BREAK - BULK/NEO BULK MODULE (10 ACRES)						
	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
	1	Civil Site Work	10 435,600	AC SF	 $4.00	 $1,742,400	Construct New Backlands, etc. Including grading,paving, striping,fencing,signage, etc.
	2	Bulkheading	500	LF	$2,000	$1,000,000	Construct new bulkheading & rip-rap as required
	3	New Concrete Wharf Construction	650	LF	$5,000	$3,250,000	Construct New Concrete Wharf Structure, etc.
	4	Site Electrical	10	AC	$35,000	$350,000	Lighting, Electrical Sub-Stations, etc.
	5	Site Mechanical	10	AC	$30,000	$300,000	Includes SD/FW/DW/SS
	6	Yard Light Standards	3	EA	$50,000	$150,000	Assume 100' light poles
	7	Warehouse(s)	90,000	SF	$50.00	$4,500,000	Covered Storage/ Warehouse
	8	Gate Facility	300	SF	$40.00	$12,000	Gatehouse and other structures, etc.
SUB-TOTAL ALL TASKS						$11,304,400	
INCLUDE CONTINGENCY OF					15%	$1,695,660	
TOTAL CONSTRUCTION COST						$13,000,060	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)						$13,000,000	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

LIQUID BULK PETROLEUM MODULE (20 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	20 871,200	AC SF	$4.00	$3,484,800	Construct New Backlands, etc. Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	800	LF	$4,000	$3,200,000	Construct New Concrete Wharf or Mooring Dolphins Structures, etc.
4	Site Electrical	20	AC	$35,000	$700,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	20	AC	$30,000	$600,000	Includes SD/FW/DW/SS
6	Yard Light Standards	8	EA	$50,000	$400,000	Assume 100' light poles
7	Piping, Storage Tanks, Manifolds, etc.	1	EA	$1,000,000	$1,000,000	Assume standard pipelines 100,000 gallon tanks, etc.
8	Warehouse(s)	0	SF	$50.00	$0	Covered Storage/ Warehouse
9	Gate Facility	300	SF	$40.00	$12,000	Gatehouse and other structures, etc.
SUB-TOTAL ALL TASKS					**$9,396,800**	
INCLUDE CONTINGENCY OF				15%	$1,409,520	
TOTAL CONSTRUCTION COST					$10,806,320	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$10,806,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

PASSENGER/CRUISE (HOME PORT) MODULE (7.5 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	7.5 326,700	AC SF	$4.00	$1,306,800	Construct New Backlands, etc. Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	500	LF	$2,000	$1,000,000	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	650	LF	$5,000	$3,250,000	Construct New Concrete Wharf Structure, etc.
4	Site Electrical	7.5	AC	$35,000	$262,500	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	7.5	AC	$30,000	$225,000	Includes SD/FW/DW/SS
6	Yard Light Standards	0	EA	$50,000	$0	Assume 100' light poles
7	Terminal Building	150,000	SF	$75.00	$11,250,000	Passenger Terminal
SUB-TOTAL ALL TASKS					**$17,294,300**	
INCLUDE CONTINGENCY OF				15%	$2,594,145	
TOTAL CONSTRUCTION COST					$19,888,445	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$19,888,000**	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate							
DATE September 30, 1996							
FISHERY MODULE (7 ACRES)							
	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
	1	Civil Site Work	7 304,920	AC SF	$4.00	$1,219,680	Construct New Backlands, etc Including grading,paving, striping,fencing,signage, etc
	2	Bulkheading	500	LF	$2,000	$1,000,000	Construct new bulkheading & rip-rap as required
	3	New Concrete Wharf Construction	600	LF	$5,000	$3,000,000	Construct New Concrete Wharf Structure, etc
	4	Site Electrical	7	AC	$35,000	$245,000	Lighting, Electrical Sub-Stations, etc
	5	Site Mechanical	7	AC	$30,000	$210,000	Includes SD/FW/DW/SS
	6	Yard Light Standards	2	EA	$50,000	$100,000	Assume 100' light poles
	7	Fishery Facility	18,000	SF	$50.00	$900,000	Covered Storage/ Warehouse
	8	Gate Facility	300	SF	$40.00	$12,000	Gatehouse and other structures, etc
SUB-TOTAL ALL TASKS						$6,686,680	
INCLUDE CONTINGENCY OF					15%	$1,003,002	
TOTAL CONSTRUCTION COST						$7,689,682	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)						$7,690,000	

Appendix C
Estimated Costs, Terminal Modules

GovGuam - Conceptual Budget Estimate

DATE: September 30, 1996

EXCURSION CRUISE MODULE (1.5 ACRES)

Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Civil Site Work	1.5 65,340	AC SF	$5.00	$326,700	Construct New Backlands, etc including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	200	LF	$2,000	$400,000	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	300	LF	$5,000	$1,500,000	Construct New Concrete Wharf Structure, etc.
4	Site Electrical	1.5	AC	$35,000	$52,500	Lighting, Electrical Sub-Stations, etc
5	Site Mechanical	1.5	AC	$30,000	$45,000	Includes SD/FW/DW/SS
6	Yard Light Standards	1	EA	$50,000	$50,000	Assume 100' light poles
7	Passenger Shelter	5,400	SF	$50.00	$270,000	Includes 1,000 SF Storage
SUB-TOTAL ALL TASKS					**$2,644,200**	
INCLUDE CONTINGENCY OF				15%	$396,630	
TOTAL CONSTRUCTION COST					$3,040,830	
TOTAL BUDGET ESTIMATE FOR TERMINAL (Rounded)					**$3,041,000**	

GMP
ASSOCIATES, INC.
Engineers/Architects

Appendix D

Estimated Costs, Victor Wharf

Appendix D
Estimated Costs, Victor Wharf

GovGuam - Conceptual Budget Estimate

DATE September 30, 1996

POSSIBLE DEVELOPMENT
FISHERY TERMINAL - VICTOR WHARF SOUTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
	Fishery Terminal Module					
1	Civil Site Work	14 609,840	AC SF	$1.50	914760	* Construct New grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	14	AC	$35,000	490000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	14	AC	$30,000	420000	Includes SD/FW/DW/SS.
6	Yard Light Standards	2	EA	$50,000	100000	Assume 100' light poles
7	Gate Site Work	1	LS	$10,000	10000	Assumes small modular gatehouse structure
8	Fishery Facility	36,000	SF	$50	1800000	Fishery building structure including ice plant, etc.

SUB-TOTAL ALL TASKS		**3734760**	
INCLUDE CONTINGENCY OF	15%	560214	
TOTAL CONSTRUCTION COST		4294974	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)		**4300000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS			
MINIMUM BUDGET	30%	**1290000**	*Assumes smaller buildings and less site work, etc
MEDIUM BUDGET	60%	**2580000**	
REALISTIC BUDGET RANGE (Rounded)		**1290000 to**	**2580000**

Appendix D
Estimated Costs, Victor Wharf

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POSSIBLE DEVELOPMENT
BREAK BULK TERMINAL - VICTOR WHARF SOUTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
	General Cargo Terminal Module					
1	Civil Site Work	10 435,600	AC SF	$1.50	653400	*Construct New Backlands,etc. Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	10	AC	$35,000	350000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	10	AC	$30,000	300000	Includes SD/FW/DW/SS.
6	Yard Light Standards	3	EA	$50,000	150000	Assume 100' light poles
8	Transit Shed	90,000	SF	$50	4500000	Covered Storage and Warehousing
9	Gate Facility	300	SF	$40	12000	*Administrative Building

SUB-TOTAL ALL TASKS		6965400	
INCLUDE CONTINGENCY OF	15%	894810	
TOTAL CONSTRUCTION COST		6860210	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)		**6900000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS			
MINIMUM BUDGET	20%	1380000	*Assumes smaller buildings and less site work, etc.
MEDIUM BUDGET	50%	3450000	
REALISTIC BUDGET RANGE (Rounded)		**1380000 to**	**3450000**

Appendix D
Estimated Costs, Victor Wharf

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POSSIBLE DEVELOPMENT -
PASSENGER CRUISE - HOME PORT TERMINAL - VICTOR WHARF SOUTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
Passenger Cruise - Home Port Terminal Module						
1	Civil Site Work	7.5 326,700	AC SF	$1.50	490050	Construct New Backlands etc Including grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc
4	Site Electrical	7.5	AC	$35,000	262500	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	7.5	AC	$30,000	225000	Includes SD/FW/DW/SS.
6	Yard Light Standards	4	EA	$20,000	80000	Assume 100' light poles
9	Terminal Building	150,000	SF	$75	11250000	Passenger Terminal
SUB-TOTAL ALL TASKS					12307550	
INCLUDE CONTINGENCY OF				15%	1846132.5	
TOTAL CONSTRUCTION COST					14153682.5	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)					14200000	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				20%	2840000	Assumes less civil site work and smaller buildings required
MEDIUM BUDGET				60%	8520000	
REALISTIC BUDGET RANGE (Rounded)					2840000 to	8520000

Appendix D
Estimated Costs, Victor Wharf

GovGuam - Conceptual Budget Estimate

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POSSIBLE DEVELOPMENT -
CONTAINER TERMINAL - VICTOR WHARF SOUTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
	Container Terminal Module					
1	Civil Site Work	60 2,613,600	AC SF	$1.50	3920400	*Assumes some grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	60	AC	$35,000	2100000	*Lighting, Electrical Sub-Stations, etc
5	Site Mechanical	60	AC	$30,000	1800000	*Includes SD/FW/DW/SS
6	Yard Light Standards	18	EA	$50,000	900000	*Assume 100' light poles
7	Gate Site Work	3 130,680	AC SF	10	1306800	*Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	3,000	SF	$75	225000	Canopies and/or Other Structures
9	Administration Building	8,000	SF	$110	880000	*Administrative Building
10	Maintenance & Repair Building	25,000	SF	$75	1,875,000	M & R Building
SUB-TOTAL ALL TASKS					**13007200**	
INCLUDE CONTINGENCY OF				15%	1951080	
TOTAL CONSTRUCTION COST					14958280	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)					**15000000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				30%	**4500000**	*Assumes smaller site, minimal civil site work and smaller buildings, etc
MEDIUM BUDGET				70%	**10500000**	
REALISTIC BUDGET RANGE (Rounded)					**4500000 to**	**10500000**

Appendix D
Estimated Costs, Victor Wharf

Gov/Guam - Conceptual Budget Estimate

DATE: September 30, 1996

POSSIBLE DEVELOPMENT
BREAK BULK TERMINAL - VICTOR WHARF NORTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
	General Cargo Terminal Module					
1	Civil Site Work	10 435,600	AC SF	$5.00	2178000	*Construct New Backlands, etc. Including grading, paving, striping, fencing, signage, etc.
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	10	AC	$35,000	350000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	10	AC	$30,000	300000	Includes SD/FW/DW/SS.
6	Yard Light Standards	3	EA	$50,000	150000	Assume 100' light poles
8	Transit Shed	90,000	SF	$50	4500000	Covered Storage and Warehousing
9	Gate Facility	300	SF	$40	12000	*Administrative Building
SUB-TOTAL ALL TASKS					**7490000**	
INCLUDE CONTINGENCY OF				15%	1123500	
TOTAL CONSTRUCTION COST					8613500	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)					**8600000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				20%	**1720000**	*Assumes smaller buildings and some major site work, etc
MEDIUM BUDGET				50%	**4300000**	
REALISTIC BUDGET RANGE (Rounded)					**1720000 to**	**4300000**

Appendix D
Estimated Costs, Victor Wharf

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POSSIBLE DEVELOPMENT -
WAREHOUSE TERMINAL - VICTOR WHARF NORTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
Warehouse Module						
1	Civil Site Work	10 435,600	AC SF	$5.00	2178000	Construct New Backlands etc. Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	10	AC	$35,000	350000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	10	AC	$30,000	300000	Includes SD/FW/DW/SS.
6	Yard Light Standards	4	EA	$20,000	80000	Assume 100' light poles
8	Gate Facility	5,000	SF	$50	250000	Canopies and/or Other Structures
9	Warehouse	90,000	SF	$50	4500000	Covered Storage and Warehousing
SUB-TOTAL ALL TASKS					7658000	
INCLUDE CONTINGENCY OF				15%	1148700	
TOTAL CONSTRUCTION COST					8806700	
TOTAL BUDGET ESTIMATE FOR HIHG END WAREHOUSE (Rounded)					8800000	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				30%	2640000	*Assumes smaller building could be initially built and only a minor portion of site work performed, etc.
MEDIUM BUDGET				50%	4400000	
REALISTIC BUDGET RANGE (Rounded)					2640000 to	4400000

Appendix D
Estimated Costs, Victor Wharf

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POSSIBLE DEVELOPMENT -
CONTAINER TERMINAL - VICTOR WHARF NORTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
Container Terminal Module						
1	Civil Site Work	30 1,306,800	AC SF	$5.00	6534000	*Assumes some grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc
4	Site Electrical	30	AC	$35,000	1050000	*Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	30	AC	$30,000	900000	*Includes SD/FW/DW/SS
6	Yard Light Standards	10	EA	$50,000	500000	*Assume 100' light poles
7	Gate Site Work	1 43,560	AC SF	10	435600	*Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	1,000	SF	$75	75000	Canopies and/or Other Structures
9	Administration Building	5,000	SF	$110	550000	*Administrative Building
10	Maintenance & Repair Building	5,000	SF	$75	375,000	M & R Building
SUB-TOTAL ALL TASKS					**10419600**	
INCLUDE CONTINGENCY OF				15%	1562940	
TOTAL CONSTRUCTION COST					11982540	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)					**12000000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				30%	**3600000**	*Assumes smaller site with some major civil site work and smaller buildings, etc.
MEDIUM BUDGET				70%	**8400000**	
REALISTIC BUDGET RANGE (Rounded)					**3600000 to**	**8400000**

Appendix D
Estimated Costs, Victor Wharf

Gov/Guam - Conceptual Budget Estimate

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POSSIBLE DEVELOPMENT
FISHERY TERMINAL - VICTOR WHARF NORTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
	Fishery Terminal Module					
1	Civil Site Work	14 609,840	AC SF	$5.00	3049200	Regrade backland area including grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	14	AC	$35,000	490000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	14	AC	$30,000	420000	Includes SD/FW/DW/SS.
6	Yard Light Standards	2	EA	$50,000	100000	Assume 100' light poles
7	Gate Site Work	1	LS	$10,000	10000	Assumes small modular gatehouse structure
8	Fishery Facility	36,000	SF	$50	1800000	Fishery building structure including ice plant, etc
SUB-TOTAL ALL TASKS					6869200	
INCLUDE CONTINGENCY OF				15%	880380	
TOTAL CONSTRUCTION COST					6749580	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)					6700000	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				30%	2010000	*Assumes required buildings and some major site work, etc
MEDIUM BUDGET				60%	4020000	
REALISTIC BUDGET RANGE (Rounded)					2010000 to	4020000

Appendix D
Estimated Costs, Victor Wharf

GovGuam - Conceptual Budget Estimate

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POSSIBLE DEVELOPMENT -
PASSENGER CRUISE - HOME PORT TERMINAL - VICTOR WHARF NORTH

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
	Passenger Cruise - Home Port Terminal Module					
1	Civil Site Work	7.5 326,700	AC SF	$5.00	1633500	Construct New Backlands etc. Including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	7.5	AC	$35,000	262500	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	7.5	AC	$30,000	225000	Includes SD/FW/DW/SS
6	Yard Light Standards	4	EA	$20,000	80000	Assume 100' light poles
9	Terminal Building	150,000	SF	$75	11250000	Passenger Terminal
SUB-TOTAL ALL TASKS					**13451000**	
INCLUDE CONTINGENCY OF				15%	2017650	
TOTAL CONSTRUCTION COST					15468650	
TOTAL BUDGET ESTIMATE FOR HIGH END TERMINAL (Rounded)					**15500000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				20%	**3100000**	Assumes some major civil site work and smaller buildings required
MEDIUM BUDGET				60%	**9300000**	
REALISTIC BUDGET RANGE (Rounded)					**3100000 to**	**9300000**

GP
ASSOCIATES, INC.
Engineers/Architects

Appendix E

Estimated Costs, SRF Area

Appendix E
Estimated Costs, SRF Area

GovGuam - Conceptual Budget Estimate

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POSSIBLE DEVELOPMENT -
CONTAINER TERMINAL - SHIP REPAIR FACILITY (Phase 1 - 50 Acres)

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
1	Civil Site Work	50 2,178,000	AC SF	$4.00	$8,712,000	Construct New Backlands etc. including grading,paving, striping,fencing,signage, etc.
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	1,200	LF	$10,000	$12,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc.
4	Site Electrical	50	AC	$35,000	$1,750,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	50	AC	$30,000	$1,500,000	Includes SD/FW/DW/SS
6	Yard Light Standards	15	EA	$50,000	$757,576	Assume 100' light poles
7	Gate Site Work	2 87,120	AC SF	$10	$871,200	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	1,000	SF	$75	$75,000	Canopies and/or Other Structures
9	Administration Building	5,000	SF	$80	$400,000	Administrative Building
10	Maintenance & Repair Building	10,000	SF	$75	$750,000	M & R Building
SUB-TOTAL ALL TASKS					$26,815,776	
INCLUDE CONTINGENCY OF				15%	$4,022,366	
TOTAL CONSTRUCTION COST					$30,838,142	
TOTAL BUDGET ESTIMATE FOR CONTAINER TERMINAL (Rounded)					$30,800,000	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				40%	$12,320,000	*Assumes smaller buildings less site work, open wharf,etc.
MEDIUM BUDGET				70%	$21,560,000	
REALISTIC BUDGET RANGE (Rounded)					$12,300,000 to $21,600,000	

Appendix E
Estimated Costs, SRF Area

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POSSIBLE DEVELOPMENT -
CONTAINER TERMINAL - SHIP REPAIR FACILITY (Phase 2 - 20 Acres)

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
1	Civil Site Work	20 871,200	AC SF	$4.00	$3,484,800	Construct New Backlands etc Including grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	1,200	LF	$10,000	$12,000,000	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc
4	Site Electrical	20	AC	$35,000	$700,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	20	AC	$30,000	$600,000	Includes SD/FW/DW/SS.
6	Yard Light Standards	6	EA	$50,000	$300,000	Assume 100' light poles
7	Gate Site Work	2 174,240	AC SF	$10	$1,742,400	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
8	Gate Facility	1,000	SF	$75	$75,000	Canopies and/or Other Structures
9	Administration Building	0	SF	$80	$0	Administrative Building
10	Maintenance & Repair Building	10,000	SF	$75	$750,000	M & R Building
SUB-TOTAL ALL TASKS					**$19,652,200**	
INCLUDE CONTINGENCY OF				15%	$2,947,830	
TOTAL CONSTRUCTION COST					$22,600,030	
TOTAL BUDGET ESTIMATE FOR CONTAINER TERMINAL (Rounded)					**$22,600,000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				40%	$9,040,000	*Assumes smaller buildings and less site work, etc
MEDIUM BUDGET				70%	$15,820,000	
REALISTIC BUDGET RANGE (Rounded)					**$9,000,000 to**	**$15,800,000**

Appendix E
Estimated Costs, SRF Area

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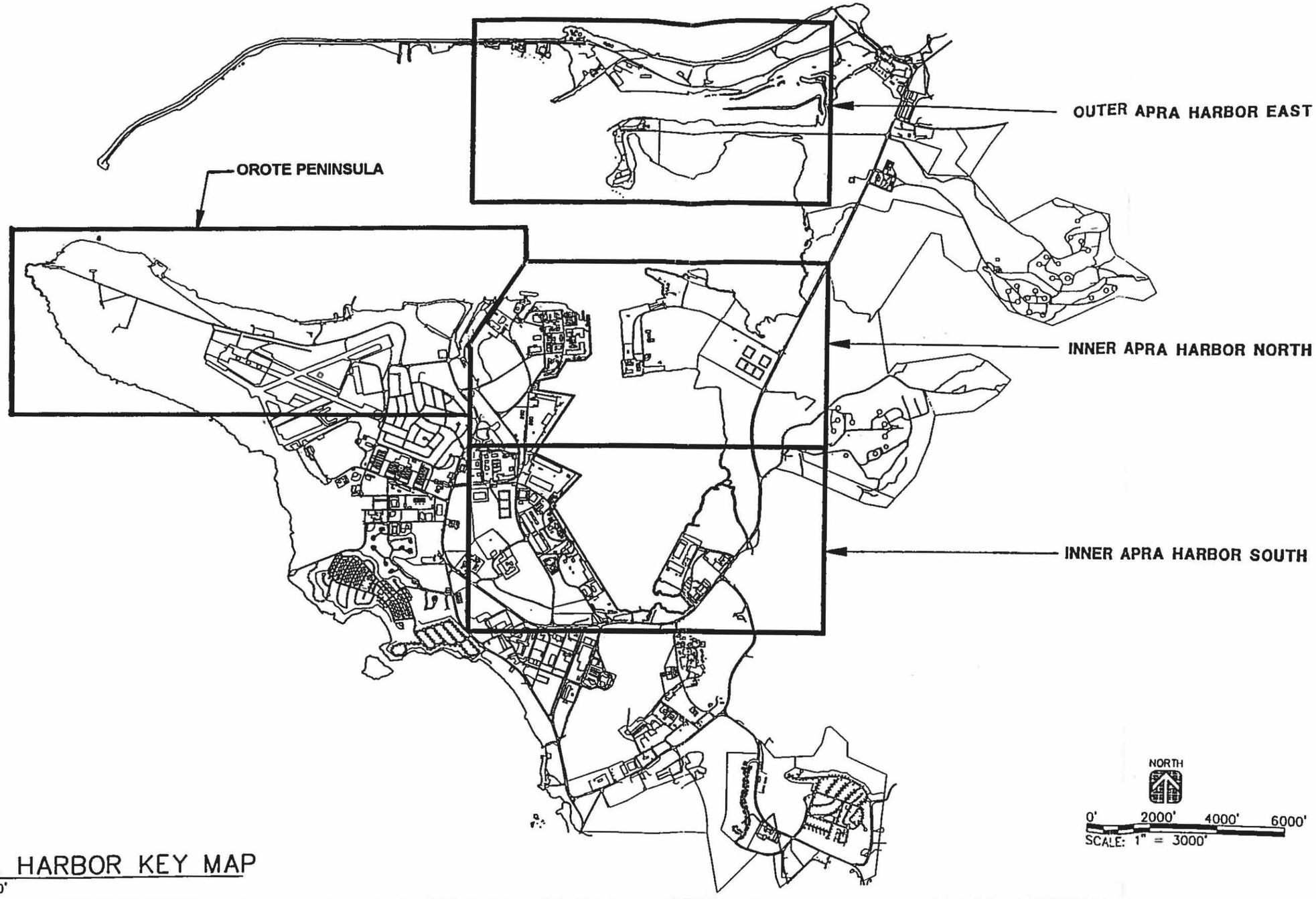
POSSIBLE DEVELOPMENT -
BREAK BULK TERMINAL - SHIP REPAIR FACILITY AREA

Item No.	Item	Quantity	Unit	Cost/Unit	Item Cost	Remarks
1	Civil Site Work	10 435,600	AC SF	$4.00	$1,742,400	Construct New Backlands etc including grading,paving, striping,fencing,signage, etc
2	Bulkheading	0	LF	$2,000	$0	Construct new bulkheading & rip-rap as required
3	New Concrete Wharf Construction	0	LF	$10,000	$0	Construct New Concrete Wharf Structures, Crane Rails, Paved Backlands, etc
4	Site Electrical	10	AC	$35,000	$350,000	Lighting, Electrical Sub-Stations, etc.
5	Site Mechanical	10	AC	$30,000	$300,000	Includes SD/FW/DW/SS
6	Yard Light Standards	4	EA	$50,000	$200,000	Assume 100' light poles
8	Gate Facility	300	SF	$75	$22,500	Canopies and/or Other Structures
9	Warehouse	90,000	SF	$65	$5,850,000	Administrative Building
SUB-TOTAL ALL TASKS					**$8,464,900**	
INCLUDE CONTINGENCY OF				15%	$1,269,735	
TOTAL CONSTRUCTION COST					$9,734,635	
TOTAL BUDGET ESTIMATE FOR CONTAINER TERMINAL (Rounded)					**$9,700,000**	
TOTAL BUDGET ESTIMATE FOR CONTAINER TERMINAL (Rounded)					**$9,700,000**	
REALISTIC BUDGET RANGE FOR REUSE CONDITIONS						
MINIMUM BUDGET				20%	$1,940,000	*Assumes smaller buildings and less site work, etc
MEDIUM BUDGET				50%	$4,850,000	
REALISTIC BUDGET RANGE (Rounded)					**$1,900,000 to $4,900,000**	

GMP
ASSOCIATES, INC.
Engineers/Architects

Appendix F

Summary Report on Data Evaluation



APRA HARBOR KEY MAP
1" = 3000'

Figure 1.1

Appendix F
Summary Report on Data Evaluation

1 INTRODUCTION

1.1 Purpose of this Report

The 1995 Defense Base Closure and Realignment Commission approved three recommendations that directly affect facilities currently operated by the U.S. Navy in Apra Harbor. The three actions are the realignment of Naval Activities, Guam, the closure of Ship Repair Facility, Guam, and the disestablishment of the Fleet and Industrial Supply Center, Guam.

With the large number of jobs lost because of the Navy's closure and realignments, economic reuse of the former Navy facilities is critical to Guam's economy. Initial economic development activities by the Guam Economic Development Authority (GEDA) have concluded that some of these facilities have the potential for immediate reuse, creating a number of new jobs and a significant economic benefit to Guam.

The purpose of this Summary Report on Data Evaluation is to identify constraints to reuse from a facility, from regulatory requirements, from geographic or infrastructural problems, or from other related matters.

1.2 Apra Harbor Complex Sub-Areas

The Apra Harbor Complex has been divided into the following four sub-areas, as shown in Figure 1.1.

1.2.1 Inner Harbor–South

The Inner Harbor–South sub-area is comprised of Victor, Uniform, and Tango Wharves, including their respective landside facilities. These landside facilities include the U.S. Coast Guard buildings, the Navy SEALS compound, and FISC administrative and warehouse buildings.

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1.2.2 Inner Harbor–North

The Inner Harbor–North sub-area is comprised of wharves Lima, Mike and November and their landside facilities of the Ship Repair Facility compound within the Apra Harbor Complex, as well as the Drum Lot on the Polaris Point peninsula.

1.2.3 Outer Harbor–East

The Drydock Island area under the cognizance of the SRF (at the western tip of Drydock Island) comprises the sub-area of Outer Harbor–East.

1.2.4 Orote Peninsula

The Orote Peninsula sub-area is comprised of the upland and beachside area of the Orote Point peninsula.

1.3 Description of Constraints to Reuse

It is important to identify specific site attributes that would constrain a sub-area's particular reuse or would require mitigative actions. The categories used to identify constraints are described below.

1.3.1 Facilities

A facilities constraint is described as the limitations placed on the sub-area pertaining to its existing water transportation and ship berthing characteristics; the existing buildings and/or easements on the site; and the existing equipment such as wharf cranes at the site.

1.3.2 Natural Environment

This section describes natural conditions and constraints that affect the development potential of a sub-area. A more detailed environmental analysis will be included in an Environmental Baseline Survey, provided by the U.S. Navy. Natural constraints of a

sub-area include soils with probable foundation problems, slopes in excess of 20%, flood-hazard areas, established critical habitat areas, and wetlands.

1.3.2.1 Soils. Soil types which could potentially constrain development include muck and fill. Substantial portions of the areas surrounding the Inner Harbor are composed of soil fill and coral spoil from harbor dredging, including the entire SRF land area and Polaris Point. In the past, fill areas usually have required extensive pile foundations for permanent concrete buildings.

Apra Harbor has experienced considerable land filling and port-related development. The 2.75-mile long Glass Breakwater was constructed during WWII along Luminao Reef and Calalan Bank to enclose the harbor. The entire eastern shoreline from Cabras Island to San Luis Point has been altered by the construction of Drydock Island, Polaris Point, and Naval Activities facilities.

1.3.2.2 Topography and Slopes. An analysis of topography and ground elevations is useful in determining areas of environmental concert such as flood-prone areas. Topographic relief maps are also essential in siting facilities that require specific surface gradients, such as water storage tanks. The Apra Harbor Naval Complex includes both relatively flat flood plains and bluffs as well as hilly ridges. The areas included in this study are in the areas surrounding Inner Harbor, where there are few extreme contour changes.

Slopes affect the cost of development and, indirectly, the environmental impact of the development. Slope compatibilities are based primarily on the amount of level land required for a typical development. Slopes greater than 20% are found primarily along the perimeter of Orote Peninsula, in the petroleum products tank farm (Sasa Valley), and along the eastern boundaries of Camp Covington and along Apra Heights. Isolated bluff formations are found throughout the station proper; however, these areas are not extensive and they also have the beneficial impact of permitting grade separation between land uses.

1.3.2.3 Flood Hazards. Flood-prone areas are determined by three major factors: terrestrial flooding, tsunamis, and storm wave surges. All land areas adjacent to the ocean or harbor are considered potentially vulnerable to high wind and wave action from typhoons. The flood prone areas usually do not extend inland significantly except in selected areas, such as the shipyard and NAVACTS marina, Polaris Point, and Drydock

Island. Terrestrial flooding caused by high rainfall intensities affect the lower reaches of river valleys. Any development sited within areas identified by the Federal Emergency Management Agency should be designed to withstand the effects of high water.

1.3.2.4 Critical Habitats. The island's wetlands, limestone forests, and savannahs provide the primary habitat for many of Guam's valuable plant and animal species. These habitats are considered important, and although each is distinct, they are biologically dependent on one another.

The Orote Peninsula Ecological Reserve has been established by the Navy to maintain the natural conditions of the cliff and undersea areas along the Peninsula's south side.

1.3.2.5 Wetlands. Wetlands are important segments of the overall environmental community on Guam. Wetlands are comprised of three basic systems. Estruarine systems are open to the ocean and are shallow water feeding areas for some fishes and birds. The more closed marsh systems provide an ecosystem suited to particular communities of plants and wildlife and may serve as filters and settling points for streams. Riverine systems number more than 40 in southern Guam, although few are natural. The Abo and Atantano wetlands in and around Apra Harbor Naval Complex are combination marsh and riverine systems.

1.3.3 Utilities

The existing utility systems for the Apra Harbor Complex and other military owned areas in Apra Harbor are all Navy-owned. The ability of the Navy to continue to supply water and sewer collection to areas turned over to GovGuam is a major development constraint. The Navy has indicated that the amount of available water and sewage loads that they would continue to provide/collect and treat would be for as much as would be "freed-up" by the closing and/or disestablishment of the BRAC areas.

1.3.4 Explosives Safety Quantity Distance (ESQD)

To safeguard against development in dangerous areas, hazard zones have been established by the Department of Defense for various quantities and types of stored explosives. Minimum distances are prescribed for separating explosives from inhabited structures,

public roads, and other explosives. The ESQD distances are relative to the quantity and type of ammunition at each location. No inhabited buildings are normally allowed within the ESQD encumbered areas.

1.3.5 Encroachment

Encroachment is defined as any Navy activity in the vicinity of the subject sub-area which has the potential to inhibit or impede private or GovGuam use at the site. The presence of an encroachment, its nature, and its severity will affect the viability of certain land uses. For example, a private-industry operation would be susceptible to encroachment by the Navy's high security operational activities such as the SEALS compound.

1.3.6 Prior and Current Uses

Prior and current Navy uses and policies represent potential constraints on proposed land use, specifically regarding environmental clean-up and mitigation. Potential land uses which are compatible with prior or current policy or plans for the sub-area are generally favorable.

2 DATA EVALUATION

2.1 Inner Harbor—South (Victor, Uniform, Tango Wharves; FISC)

2.1.1 Facilities

2.1.1.1 Harbor Waters. The harbor channel depths in the Inner Harbor South sub-area range between 32 to 40 feet. This may limit larger vessel accessibility. The Inner Harbor South wharf berths are more shallow than the harbor floor. The depths range between 24 to 30 feet, with a predominant depth of 26 feet throughout the area. Whatever depths required for the harbor channel floor must be matched at the wharf berths through maintenance dredging. The Inner Harbor's natural flow and flushing system is relatively weak. This may pose a pollution constraint to high volume uses if any residue from boat operations, e.g. fish and/or bilge waste, ultimately reaches the harbor water. However, since fish and/or bilge residue should not be permitted anywhere in the inner or outer harbor, it should not be considered a problem specific to the Inner Harbor.

Any wharf construction or dredging would require an Army Corps of Engineers permit.

2.1.1.2 Wharf Apron. The Uniform Wharf appears to be in the poorest condition of the Inner Harbor South wharves. Part of the wharf is bowed and the fenders are in very poor condition. At the Victor Wharf northern berths, there is some earthquake damage; however, there may be plans to repair the damage.

The fenders, which protect both the wharf and vessels, vary in condition throughout the section. At the southern berths of Victor Wharf, the fenders appear to be in adequate condition. At the northern berths of Victor Wharf and at both the Tango and Uniform wharves, the fenders are in medium to poor condition.

2.1.2 Natural Environment

2.1.2.1 Soils. The wharf front area of Inner Harbor South is comprised of fill material, categorized in the Soil Survey of the Territory of Guam as "Urban land—Ustorthents complex." The slope is flat at 0 – 3 percent, with elevation at 0 – 10 feet. Ustorthents consist of quarried fill material. It commonly is crushed coral gravel and cobbles and a few pockets of very gravelly clay and clay loam. Permeability of these Ustorthents is moderately rapid. The available water capacity is very low. Runoff is slow, and the hazard of water erosion is slight. This unit is used as homesites, as commercial and industrial sites, and for other urban uses.

There is an undeveloped inland parcel of land at the southwestern quadrant of Inner Harbor South. According to Navy planning maps, it is under the cognizance of FISC. It is enclosed by Sumay Drive to the west, Marine Drive to the south, and the road immediately after the Main Gate to the east and north. The area is currently overgrown with dense brush (tangen-tangen). The soil in this area is classified as "Ritidian-Rock outcrop complex." This soil unit is on plateaus and escarpments. The Ritidian soil is shallow and well drained. It formed residium derived dominantly from coralline limestone. Permeability of this Ritidian soil is moderately rapid. Available water capacity is very low. Runoff is very slow and the hazard of water erosion is slight. This soil unit is used as wildlife habitat and watershed. It can be used for recreational development. The main limitation is the areas of jagged, uneven, limestone rock outcrop. The use of the unit as wildlife habitat and watershed can be enhanced by maintaining the native forest cover. If this unit is used for recreational development, the main limitation is the areas of Rock outcrop. Use would be limited to a few paths and trails.

At the southern portion of Victor Wharf backland, there is a small hill about 600 feet inland. This knoll is fenced and situated well back from the wharf apron. It is approximately 6 feet above adjacent grade.

Another small knoll of approximately 6 to 10 feet exists at the northern portion of the Victor Wharf. It is currently being used by the Navy SEALS. The hill is situated near the Victor Wharf apron and partly in the backland. This minor, but not insignificant, elevation can constrain some land-intensive uses proposed for immediate reuse. For example, it must be leveled if container, break bulk or similar activities wish to use this area. Whether or not the hill is removed, there is approximately 150 feet of the wharf apron to accommodate various port operations, and cruise bus access if necessary.

2.1.2.2 Topography and Slopes. As described above, the slopes of Inner Harbor South are relatively flat at the wharf area, and gently rolling in the grassy areas. There are no major slope constraints in this sub-area.

2.1.2.3 Flood Hazards. The entire length of the wharf apron of Inner Harbor South is within the 100-year flood zone. Inherent in it being a waterfront area, it is vulnerable to high winds and wave action during typhoon conditions.

2.1.2.4 Critical Habitats. There are no critical habitats in the Inner Harbor South sub-area.

2.1.2.5 Wetlands. According to the National Wetlands Inventory, published by the U.S. Department of the Interior Fish and Wildlife Service, there are estruarine wetlands at the southern corner of Victor Wharf where the harbor water meets the land. This area is currently undeveloped.

In addition, the National Wetland Inventory indicates that there is a palustrine forested wetland in the landside area that is locked in by Sumay Drive, Marine Drive and the wharf-front road. This is the undeveloped FISC area that was described earlier.

2.1.3 Utilities

2.1.3.1 Water. There are existing water distribution lines located in the Inner Harbor South sub-area. The main constraint to development regarding water is the amount of water available. The water demand of any proposed use should not exceed the current user's demand.

2.1.3.2 Sewer. The existing wastewater collection/pump system at Inner Harbor South is designed to carry the existing tenant loads as well as loads from ships berthed at Victor, Uniform and Tango wharves. A recent Utility Technical Study (UTS) concluded that there may be excessive infiltration caused by leaks in the collection system from earthquake-damaged pipes. The collection pipes along Victor Wharf appear to be damaged by the August 8, 1993 earthquake. Infiltration along the waterfront appears to be confined mainly to the area near Victor Wharf.

The main constraint to development regarding wastewater collection is the capacity of the Apra Harbor Wastewater Treatment Plant to take on the wastewater loads of a civilian development. The Navy has indicated that it would not be able to handle any additional capacity than it is already handling.

2.1.3.3 Electricity. Inner Harbor South is currently served by Guam Power Authority for electricity. The Navy-owned Orote Power Plant will not provide electricity to the civilian community.

2.1.4 Explosives Safety Quantity Distance (ESQD)

There are no ESQD arcs encumbering the Inner Harbor South sub-area.

2.1.5 Encroachment

The U.S. Coast Guard is currently located at Victor Wharf berths 3 and 4. The Coast Guard compound is fenced off and is accessible through the Main Gate via Sumay Drive, or by the secondary road which parallels Victor Wharf and runs into Marine Drive near the Main Gate. This area has been slated to remain under the jurisdiction of the Coast Guard.

The Navy SEALS are currently located along Victor wharf berths 1 and 2. They have an enclosed compound area on the landside of these berths. Until the SEALS are relocated, there is an encroachment constraint on the Inner Harbor South. If the SEALS were to move, the earliest a new facility could be built is 2–4 years.

2.1.6 Prior and Current Uses

The Inner Harbor South waterfront is currently under the cognizance of several activities. Uniform and Victor wharves are under the command of NAVACTS. Uniform Wharf is now abandoned due to earthquake damage. Prior to the earthquake, the entire frontage of Uniform wharf was used by FISC Guam. The entire working area behind Uniform Wharf is currently used by FISC. Prior to the earthquake, the Harbor Control Office (building 3113) was located at the northern tip of Uniform Wharf, and the Fleet Landing Building (building. 3150) was as the corner of Uniform and Victor Wharves.

Victor Wharf is currently used by NAVACTS, the U.S. Coast Guard, and the Navy SEALS. NAVACTS uses Victor for its small boat and harbor tug operations as well as for limited transient berthing. After the earthquake, the Port Control Office and Waterfront Service Support activities were moved to building 3152, located between the U.S. Coast Guard and the Navy SEALS, in front of berth Victor 2. As mentioned earlier, the U.S. Coast Guard uses Victor Wharf 3 and 4, as well as the landside area behind these berths. The Navy SEALS occupy the berthing space and landside area at Victor 1. The southern landside facilities of Victor include the Base Pass and Security Office, a Thrift Shop, Police Station, and Toyland.

Tango Wharf is currently used by FISC Guam as the loading/unloading wharves of the Navy's supply ships.

2.2 Inner Harbor–North (SRF area, Polaris Point Drum Lot)

2.2.1 Facilities

2.2.1.1 Harbor Waters. The harbor waters included in this sub-area are those at SRF. The Polaris Point Drum Lot is not a waterfront site. The water depths in this part of the harbor range from 33 to 44 feet deep. Similar to the Southern section, dredging might be needed to accommodate larger vessels. Like the Inner Harbor South, the wharf berth

depths are not as deep as the harbor floor. The wharf berth depths range from 24 to 30 feet, with the dominant depth of 30 feet. This area may require maintenance dredging.

2.2.1.2 Cranes. There are four operational cranes at the SRF, two floating cranes and two gantry cranes. The floating cranes are of older stock: one is 1944 vintage and the other is 1969 vintage. The gantry cranes are 1941 vintage and "newer"; unfortunately the second crane could not be identified except as being newer than its companion. The age of the cranes could represent a constraint.

2.2.1.3 Wharf Apron. In general, conditions appear to be adequate for future operations at the Ship Repair Facility.

2.2.2 Natural Environment

2.2.2.1 Soils. The SRF area of Inner Harbor North is comprised of fill material "Urban land—Ustorthents complex", similar to the Inner Harbor South wharf front area. The slope is flat at 0–3 percent, with elevation at 0–10 feet.

The Drum Lot at Polaris Point is also comprised of "Urban land—Ustorthents complex" fill material. The foundation stability of this soil type is a constraint to any proposed development.

2.2.2.2 Topography and Slopes. The slopes of Inner Harbor North are relatively flat at both the SRF areas and Polaris Point Drum Lot areas. There are no major slope constraints in this sub-area.

2.2.2.3 Flood Hazards. The entire area of the SRF complex is within the 100-year flood zone. Inherent to it being a waterfront area, it is vulnerable to high winds and wave action during typhoon conditions.

At the Polaris Point Drum Lot, approximately half of the area is within the 100-year flood zone.

2.2.2.4 Critical Habitats. There are no critical habitats in the Inner Harbor North sub-area.

2.2.2.5 Wetlands. There are approximately 20 acres of wetlands west of the SRF compound, across Harbor Road. These wetlands are a constraint to development.

In addition, wetlands constrain approximately 15 acres of the Polaris Point Drum Lot area along Marine Drive, across the Polaris Point access road. These wetlands are a constraint to development on this portion of the parcel.

2.2.3 Utilities

2.2.3.1 Water. There are existing water distribution lines located in the Inner Harbor North sub-area. The main constraint to development regarding water is the amount of water available. The water demand of any proposed use should not exceed the current user's demand.

2.2.3.2 Sewer. The existing wastewater collection/pump system at the SRF area is designed to carry the existing tenant loads. The main constraint to development regarding wastewater collection is the capacity of the Apra Harbor Wastewater Treatment Plant to take on the wastewater loads of a civilian development. The Navy has indicated that it would not be able to handle any additional capacity than it is already handling.

2.2.3.3 Electricity. Inner Harbor North is currently served by Guam Power Authority for electricity. The Navy-owned Orote Power Plant will not provide electricity to the civilian community.

2.2.4 Explosives Safety Quantity Distance (ESQD)

Buildings 20 and 21 at the SRF area are currently encumbered by the ESQD arc emanating from the Polaris Point submarine tender. During the course of this study, the Navy has stated that this arc will no longer encumber buildings 20 and 21 when this Reuse Plan and the property turnover is complete. There are no ESQD arcs encumbering the Polaris Point Drum Lot.

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2.2.5 Encroachment

Although the existing SRF area is currently a restricted and isolated area, it will be surrounded by NAVACTS operations to the south at Oscar, Romeo, and Sierra wharves once it is opened for civilian use. The Polaris Point Drum Lot is accessible directly off the Polaris Point access road and Marine Drive. The Navy will continue to operate the submarine facilities at Polaris Point, west of the Drum Lot area. Encroachment by the Navy in these two areas is not deemed a development constraint.

2.2.6 Prior and Current Uses

The SRF area is currently under the cognizance of SRF Guam. It is lightly developed with outmoded facilities that include ship maintenance shops and equipment laydown areas. Permanent buildings include the primary ship repair facilities at buildings 20 and 21, foundry, sandblast/paint facility, paint locker, hazardous material storage facility/AFFF, guard shack, and a pass/ID office. The current industrial use of the SRF area poses a constraint to any proposed development that would be of a different nature.

The Polaris Point Drum Lot was at one time used as a hardstand for fuel bladders. It has been abandoned as a hardstand for a number of years. There are no buildings on the site, but its prior use as a hardstand poses a constraint in that there may be some environmental clean-up of fuel spills. Until the Environmental Baseline Survey is provided by the Navy, this constraint cannot be determined.

2.3 Outer Harbor—East (Drydock Island)

2.3.1 Facilities

2.3.1.1 Harbor Waters. The Drydock Island area enjoys much deeper water depths than those of the Inner Apra Harbor. The channel depths leading to Drydock Island range from 45 to 80 feet. The depths at the wharf range from 57 to 76 feet. This is more than sufficient for a proposed dinner boat and recreational uses. There is no constraint due to the harbor waters.

2.3.1.2 Wharf Apron. There are very few significant port facilities at the Drydock Island. One wharf does exist, yet it appears to be in a state of disrepair and probably unsafe. If substantial land-to-water uses are proposed at Drydock Island in the future, a more adequate wharf should be constructed.

2.3.2 Natural Environment

2.3.2.1 Soils. The peninsula tip area of Drydock Island is comprised of fill material "Urban land—Ustorthents complex", similar to the Inner Harbor North and South wharf front areas. The slope is flat at 0–3 percent, with elevation at 0–10 feet. Similar to other fill area, the constraint to development is the foundation stability on this fill soil.

The Drydock Island parcel that lies directly north of the current GovGuam parcel (across the access road) is comprised of "Shioya loamy sand" according to the Soil Survey. This soil unit is deep and very well drained. It is formed from water-deposited coral sand. Runoff is slow and the hazard of water erosion is slight. This unit is used mainly for recreation and wildlife habitat The main limitation of this soil unit for recreational development is the risk of damage from waves during typhoons. Facilities should be as far from the ocean as feasible, and they should be designed to withstand high waves and wind. Plant cover can be maintained by limiting traffic.

2.3.2.2 Topography and Slopes. The slopes of Outer Harbor–East sub-area are relatively flat. There are no major slope constraints in this sub-area.

2.3.2.3 Flood Hazards. The entire western tip peninsula area of the Drydock Island is within the 100-year flood zone. Inherent in it being a waterfront area, it is vulnerable to high winds and wave action during typhoon conditions. The parcel parallel to the access road (east of Echo wharf) is not in a flood hazard area.

2.3.2.4 Critical Habitats. There are no critical habitats in the Outer Harbor East sub-area.

2.3.2.5 Wetlands. The coral fringing reef areas surrounding the Drydock Island are considered marine subtidal wetlands. There may be a constraint on development

pertaining to protecting these coral heads. The Environmental Baseline Survey may provide further information in this area.

2.3.3 Utilities

2.3.3.1 Water. There are existing water distribution lines located at the Outer Harbor East Drydock Island sub-area. The main constraint to development regarding water is the amount of water available. The water demand of any proposed use should not exceed the current user's demand.

2.3.3.2 Sewer. There are no sewer collection systems in the Outer Harbor East sub-area. The existing facilities in the area use a septic tank/leaching field wastewater system. There is a constraint on development to provide a sewer collection system that would discharge into a PUAG sewerline along Marine Drive in the vicinity of the Piti Power Plant.

2.3.3.3 Electricity. The Guam Power Authority currently provides power to the Outer Harbor East sub-area. There is no constraint on development with regard to electrical service.

2.3.4 Explosives Safety Quantity Distance (ESQD)

There are no ESQD arcs that encumber the Outer Harbor East sub-area.

2.3.5 Encroachment

The Navy's fuel operations located at Delta and Echo wharves on Drydock Island will continue to be operational. This area is currently a restricted area with a sentry guard posted. The Government of Guam is the current landowner of the area directly east of the Drydock peninsula tip. The Marianas Yacht Club currently has a lease agreement with the Port Authority of Guam to use a portion of this parcel for its clubhouse and private moorings.

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2.3.6 Prior and Current Uses

The Drydock Island peninsula tip is currently under the cognizance of the SRF. It had been used as a floating drydock wharf (hence the name, Drydock Island) and support craft maintenance. Currently, there is a beach park pavilion and bathroom facilities located on the site. The parcel adjacent to Echo wharf has never been developed.

2.4 Orote Peninsula

2.4.1 Facilities

2.4.1.1 Sumay Cove Marina. The Sumay Cove Marina is located at the northwest quadrant of the Orote Peninsula sub-area, adjacent to the SRF. The marina is used for private boat moorings. The water depth varies from 18 feet at the mouth of the marina entrance into Apra Outer Harbor, to a very shallow 3 feet at the inner-most area. The facility includes a marina boathouse, sixteen 60-foot, open-type, reinforced hollow concrete piers. When the boathouse was constructed to upgrade the facility to a marina, the other improvements at the site included bulkhead extension, ramp upgrades, sheet-piling, pile dolphins, dredging, a fuel station, sewage pump station, utilities, and other site improvements. At present, the marina is the only recreational boat facility available exclusively to U.S. military personnel on Guam. The marina also supports training in sailing and water safety.

2.4.1.2 Beaches. Gab Gab Beach is the Navy's Morale and Recreation beach located along the Outer Apra Harbor waterfront, at the foot of the peninsula's cliffs. There are existing beach pavilions and parking available for Navy personnel and their families.

2.4.2 Natural Environment

2.4.2.1 Soils. There are several different soil types found on Orote Peninsula. The Sumay Cove area is made up of "Urban land—Ustorthents complex" fill, as described earlier.

The outside fringes of the peninsula are made up of "Ritidian-Rock outcrop", varying in slope from 3 to 99 percent slopes. The Ritidian soil is very shallow and well drained. It

formed in residuum derived dominantly from coralline limestone. Typically, 60 to 90 percent of the surface is covered with gravel, cobbles, and stones. The soil is dark reddish brown extremely cobbly clay loam 10 centimeters thick over porous coral limestone. Permeability of this Ritidian soil is moderately rapid. Available water capacity is very low. Runoff is very slow, and the hazard of water erosion is slight. The Rock outcrop is exposed to areas of white, porous coralline limestone. The surface is jagged and irregular. Organic debris, soil material, and roots are in the cracks and interstices. Permeability is rapid, and runoff is very slow. The main limitation of this soil is the areas of jagged, uneven, limestone Rock outcrop. The central portion of the peninsula was used as an airfield by the Navy from 1921 to 1934. It was reactivated in WWII during the Japanese occupation. It is inactive as an airfield. The Soil Survey has classified this area as "Guam-Urban and complex". This unit is on limestone plateaus, and most areas have been disturbed by land shaping for urban development. Most of the area is covered by roads and airstrip. The soil unit is made up of Guam cobbly clay loam and Urban land. The Guam cobbly clay loam is very shallow and well drained. Typically, the surface layer has been removed or mixed with the underlying material during construction. The subsoil is dusky red cobbly clay loam about 15 centimeters thick over porous coralline limestone. Depth to limestone commonly is 5 to 25 centimeters; however because of cutting, filling, and leveling, limestone is at the surface in some places. Permeability if the soil is moderately rapid. Available water capacity if very low. Runoff is slow, and the hazard of water erosion is slight. The main limitation of this unit is the very shallow depth of the Guam soil, which makes excavation difficult.

2.4.2.2 Topography and Slopes. The Orote Peninsula is primarily plateau land, with fringing coastal lowlands and valley floors along the northern edge. The west and southwest land edges are shear clifflines, with no coastal lowlands to speak of. The cliffs are near-straight vertical. The upper plateau is near flat, with areas of slopes in excess of 10% located along the outside edges.

2.4.2.3 Flood Hazards. The Sumay Cove area made up of fill soil is within the 100-year flood zone. Inherent in it being a waterfront area, it is vulnerable to high winds and wave action during typhoon conditions.

2.4.2.4 Critical Habitats The Orote Peninsula Ecological Reserve is located along the south-western coastal shore of the peninsula. It has been established by the Navy and GovGuam to preserve cliff and underwater habitats along the peninsula's south side. The

critical habitat is a constraint on development pertaining to protection of these areas. The EBS may provide further information regarding this constraint.

2.4.2.5 Wetlands. The coastal fringes of the Orote peninsula have been identified as marine system wetlands. There may be constraint on development pertaining to protecting these coral reef systems. The EBS may provide further information regarding this constraint.

2.4.3 Utilities

2.4.3.1 Water. The Sumay Marina is served with water by a 4-inch branch waterline that comes off the 12-inch waterline along San Luis Road. From this same 12-inch on San Luis Road, a 12-inch branches off at Orote Point Road. The Orote Point Road waterline has a 2-inch branch to serve Gab Gab Beach, then extends up to the Kilo Wharf road, where is forks into an 8-inch line to serve Kilo Wharf and a 6-inch that extends to the Firing Range towards the tip of Orote Point. There are no existing waterlines located on the upper peninsula.

2.4.3.2 Sewer. The Sumay Marina is not connected to the Apra Harbor Wastewater collection system. There is a septic tank/leaching field collection system to serve the boathouse. Starting from Kilo Wharf at the tip of Orote Point, sewage pump station no. 32 pumps wastewater via a 6-inch force main along Orote Point Road, to a manhole east of the Gab Gab Beach entrance. Gab Gab Beach is not served by any sewer collection system. There are no existing sewerlines located on the upper peninsula.

2.4.3.3 Electricity. There are existing overhead powerlines serving the Sumay Marina Area, Gab Gab Beach, Kilo Wharf and the Firing Range. There are no powerlines on the upper peninsula.

2.4.4 Explosives Safety Quantity Distance (ESQD)

Because Kilo Wharf is the Navy's main ordnance loading/unloading wharf, it is site-approved for 3.0 million pounds of net explosive weight. This generates an Inhabited Building Distance (IBD) ESQD arc of 7,210 feet and a Public Traffic Route (PTR) distance of 4,325 feet. The IBD arc encumbers all of Orote Point Peninsula and the PTR

encumbers approximately 60 percent. The IBD distance is defined as the required separation distance between the explosive site and a building or structure, other than an explosive operating building occupied in whole or in part as a habitation for human beings, or a building or structure where people are accustomed to assemble. The arc is only considered to be encumbering when ordnance is located at Kilo Wharf. Since this is a loading/unloading wharf, this arc encumbrance is not constant. However, there have been instances in the past where the weapons are stored for a period of time, thus encumbering the IBD for a period of time. When the ordnance is being loaded/unloaded or stored, the Navy has closed off Gab Gab Beach and the firing range located on the peninsula.

2.4.5 Encroachment

The Navy will maintain its activities at Kilo Wharf. The Navy has indicated that the Gab Gab Beach may be opened to joint military/civilian use as part of the BRAC Reuse Plan. The Sumay Cove may also be used as a joint military/civilian marina, however, the Navy has not included this in any of their turnover discussions. Therefore, encroachment on the Orote Peninsula sub-area will stem from existing Navy activities.

2.4.6 Prior and Current Uses

Seven of eight Historic Sites located on Orote Peninsula are located within the subject sub-area. The sites and their classifications are listed below:

Site Name	Historic Period	Classification
Orote Airfield	First American Period(1898–1941)	Guam/National Registers
Cable Station	First American Period(1898–1941)	Guam Register
Pan American Hotel	First American Period(1898–1941)	Guam Register
Spanish Steps	Spanish Period(1521–1898)	Guam Register
Spanish Well	Spanish Period(1521–1898)	Guam Register
Fort Santiago	Spanish Period(1521–1898)	Guam Register

These historical sites should be taken into consideration for any planned projects in their vicinity.

The current uses of the Orote Peninsula sub-area have been described earlier. Sumay Marina is used as a recreational boat harbor. Gab Gab Beach is a recreational beach

facility. West of Gab Gab beach is Kilo Wharf, the Navy's ammunition wharf, as well as the firing range. The upper plateau (the Orote Airfield historic site) is an inactive airfield construction in 1921 and used by a marine squadron based there until 1927. The airfield was then used by a patrol squadron until 1934 when it was closed as an economic measure. The field was later used by the Japanese in 1944 and most of the original runways were destroyed by American air raids in that year. The airfield is inactive.

3 OVERALL CONSTRAINTS

3.1 Potable Water Production

All of the Navy's properties identified for release are serviced by the Navy's water system. Hence, the system's capacity to produce and treat water can be a potential constraint if reuse developments generate potable water demands that are significantly greater than current usage.

The Fena Reservoir together with the Almagosa and Bona Springs is the major production source for the Navy system. The average daily yield is 12.3 mgd. Three wells located at NCTAMS Finegayan collectively contribute an additional 0.4 mgd.

The Fena Water Treatment Plant treats the combined surface and spring water with chemical addition, clarification, filtration, and disinfection. The plant treatment capacity is 13.5 mgd with through-put normally ranging between 10.5 mgd to 12.5 mgd.

The distribution system delivers water to Navy facilities at NAVORD, Apra Harbor Complex, Nimitz Hill, and NCTAMS at Finegayan, as well as civilian areas in Agat, Santa Rita, Nimitz Hill, and Tanguisson power plant. Figure 3.1, as reproduced from the Utility Technical Study[1] shows the historical record of water sales from 1985 to 1993. The production and treatment capacities have been superimposed on the graph. The following trends are evident. The trend for production has been to approach the average daily yield. Over the historical record, Navy consumption has fallen while the civilian consumption has increased to equal levels. These trends demonstrate that other production sources will be needed if consumption significantly exceeds current levels. PUAG has initiated the construction of a transmission line which will permit the export of water to Agat from the Ugum river watershed.

[1] Utility Technical Study for Potable Water and Sanitary Sewer Systems, Chapter 4, Volume I, December 1994.

Appendix F
Summary Report on Data Evaluation

3.2 Wastewater Treatment Capacity

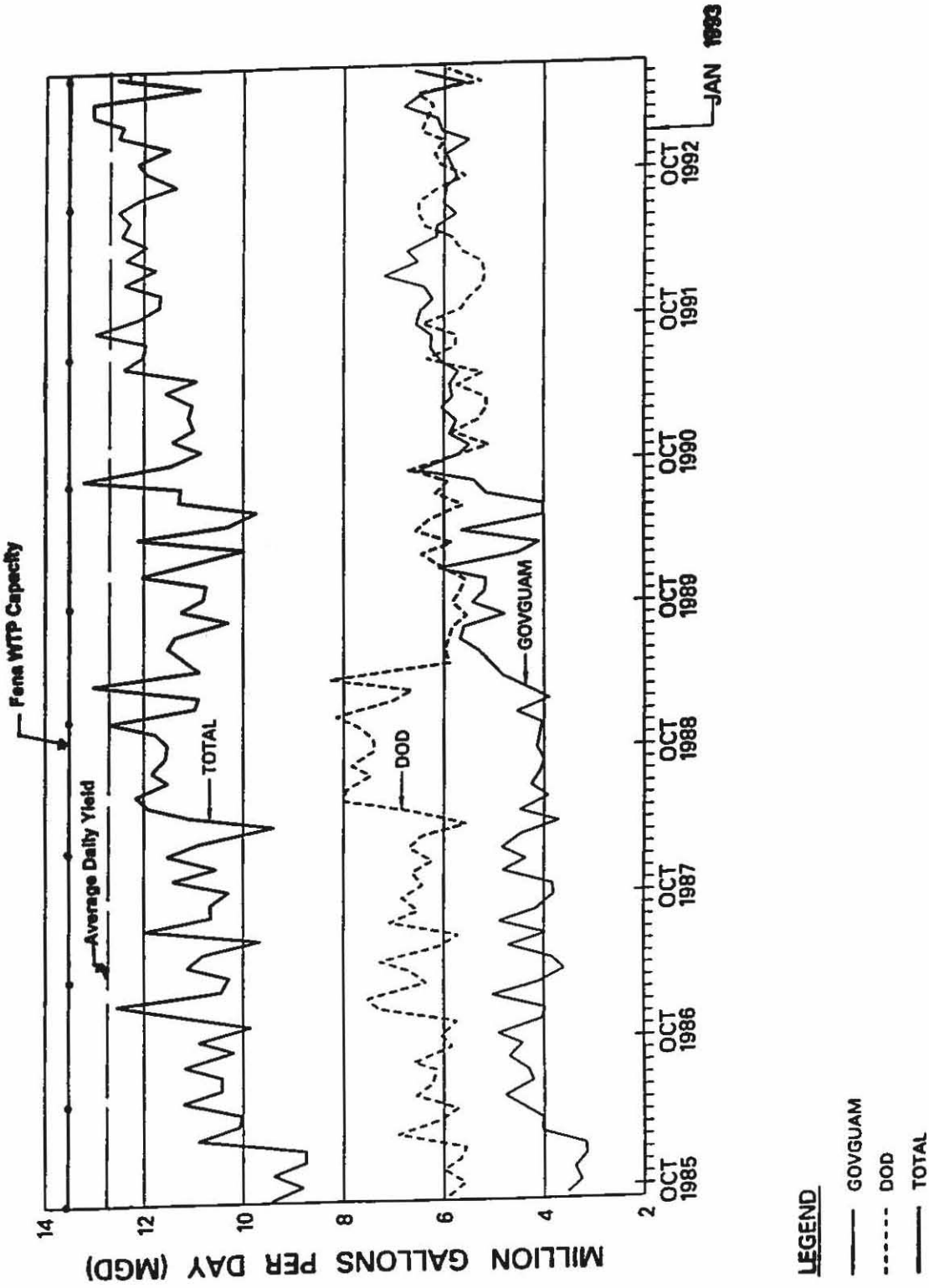
All of the Navy properties identified for release except Dry Dock Island are service tributaries to the Apra Harbor Wastewater Treatment Plant. Hence, the plant capacity to treat wastewater generated by the reuse of these properties is a potential constraint.

The Apra Harbor Wastewater Treatment Plant was built in 1972 to provide primary treatment of wastewater generated within the Naval Base. The design capacity of the original plant was 3.2 mgd. In recent years, the treatment has undergone two major upgrades and is scheduled for a third. The first upgrade (FY91 MCON P-141) added secondary treatment to the existing facility with no change in hydraulic capacity. This project was completed in 1994. The second upgrade (FY94 MCON P239P) adds redundancy to certain stream unit operations, namely primary and secondary clarification, solids contact and re-aeration, and disinfection. This upgrade would increase the plant's capacity to 4.3 mgd. The project is currently under construction and scheduled for completion by December 1996. The projected increase in capacity may be compromised by a dispute with the contractor, together with revised flow projections, which has resulted in the Navy reconsidering upgrading of the biotower pumps. The disposition of this decision is unresolved at the time of this report.

The third upgrade (FY96 MCON P-222) was intended to complete redundancy of liquid stream unit operations, add odor control, upgrade influent and effluent pumps, replace effluent force main, and upgrade solid stream unit operations which would increase treatment capacity to 6.4 mgd. Prior to completion of design, those components which would increase plant capacity were deleted for a cost savings of $4,615,000. These components are the upgrade of the influent and effluent pumps, replacement of force main, and addition of a primary anaerobic digester.

Historically, the collection system to the Apra Harbor Wastewater Treatment Plant has received significant inflow/infiltration. The problem was severely aggravated by the August 1993 earthquake, which caused plant flows to increase by more than threefold. The monthly average flow from Nov. 1995 through Jan. 1996 was 6.42 mgd as reported in the plant's Discharge Monitoring Reports.

Appendix F
Summary Report on Data Evaluation



Appendix F
Summary Report on Data Evaluation

- 4.3 mgd by upgrading the Biotower recirculation pump impellers
- 6.4 mgd by upgrading the influent/effluent pumps, installing a larger effluent force main and a primary anaerobic digester.

ASSOCIATES, INC.
Engineers/Architects

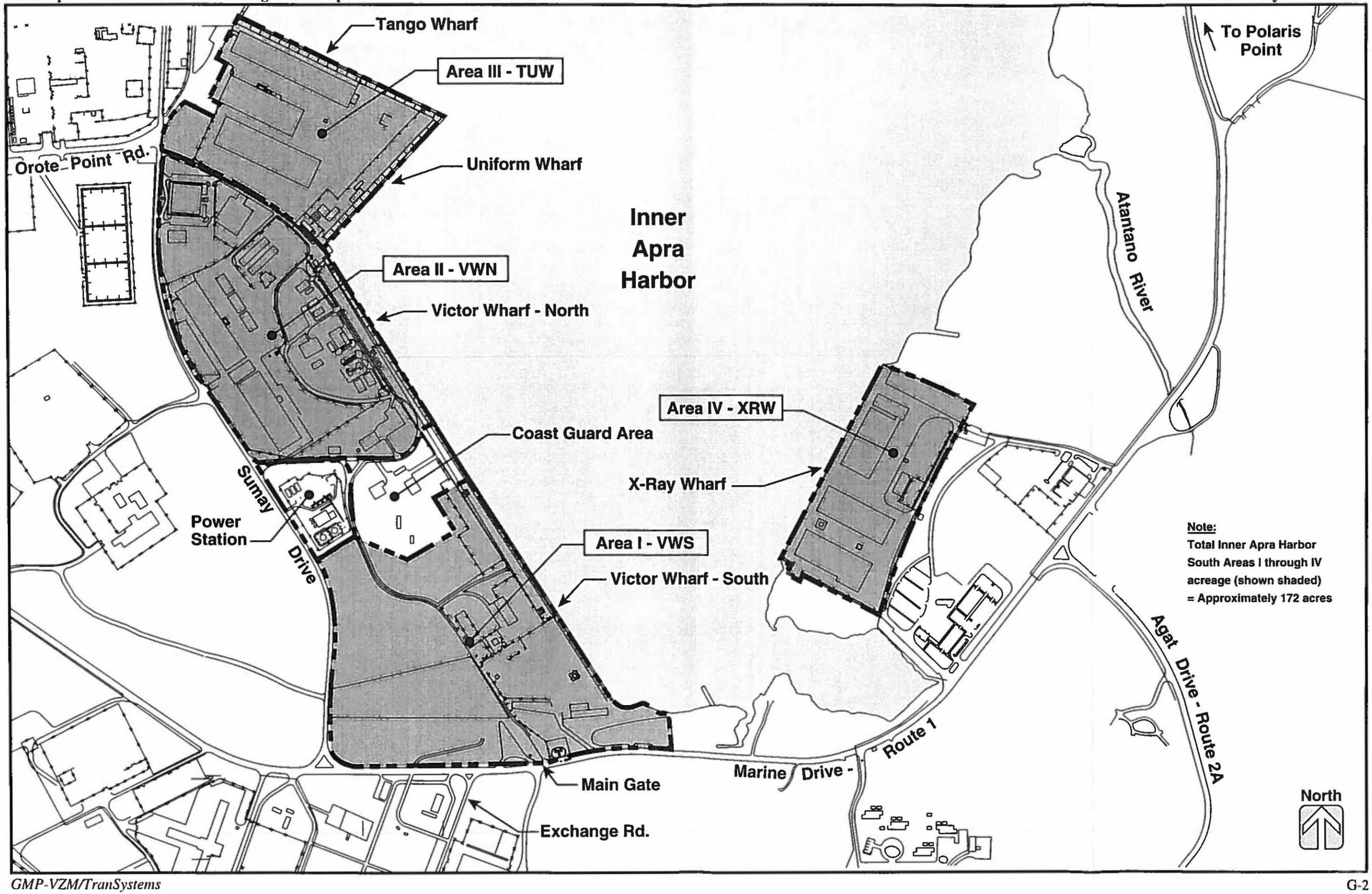
Appendix G

Physical Inventory of Facilities

Inner Apra Harbor - South

Area I through Area IV (Including Tango, Uniform, Victor South and North and X-Ray Wharfs)

Inner Apra Harbor - South - Area Designation Map

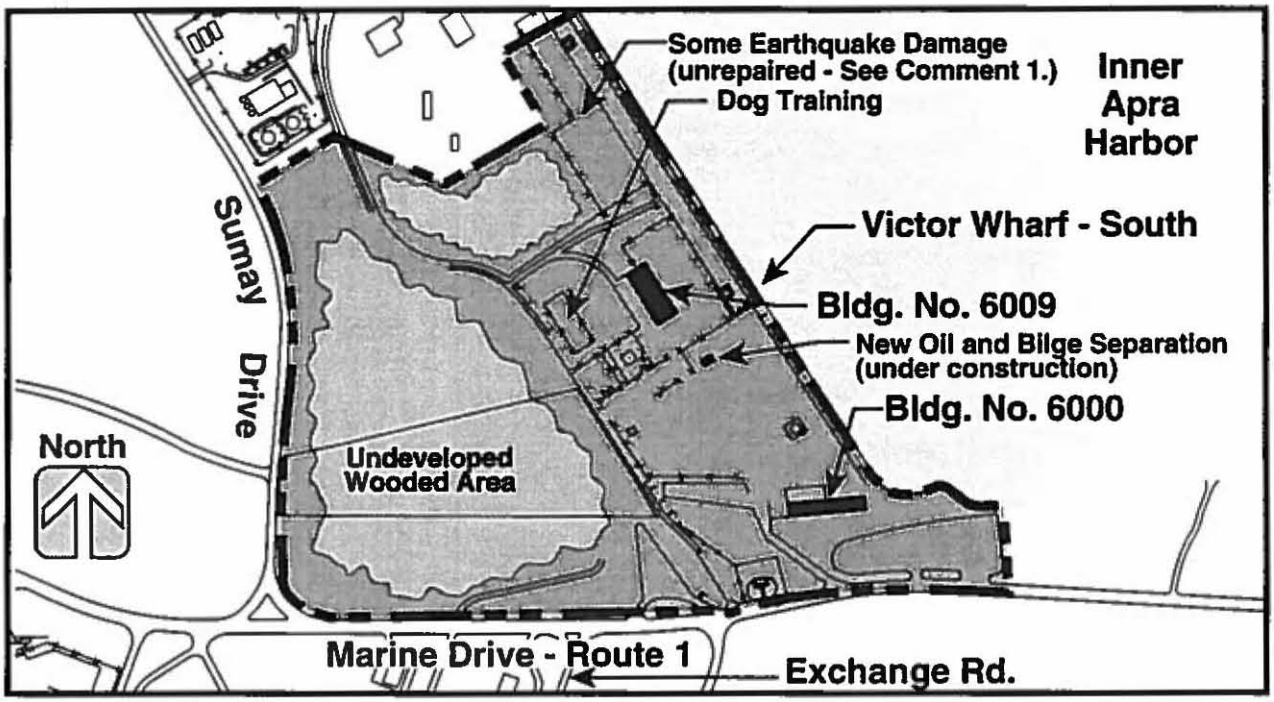


Inner Apra Harbor - South

Area I - VWS
(Victor Wharf South)

Location Map - Inner Apra Harbor - South

Area I - VWS



Approximate Area I - VWS Acreage = 62 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
6009	NAVACTS	General Whse	15,300	Good condition; estimated clearance height 25', 3 truck doors west side only.
6000	NAVACTS	Toyland	12,000	Appear in good condition

Comments:

1. Paving good, but many potholes

Area I - VWN

Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
Victor - South	NAVACTS	*1,750	28 - 30	Good, recent repair of earthquake damage

* Berth length equals portion considered as part of Area I - Victor Wharf - South. Total wharf length = 3,465 feet, see also Area II - VWN. Total wharf length includes area designated for Coast Guard use.

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
V - south	Yes	Yes	Yes	No	Yes	No	Yes

Miscellaneous Wharf

Wharf Name	No. of Cranes	Type	Approx. Capacity Tons	Fender Type	General Condition
Victor - South	None	NA	NA	Horizontal 10' Rubber	At approx. 20' on center. Good Condition.

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Marine Drive	2 each way	Good	A	B-C in rush hour
Sumay Drive	1 each way	Fair	A	B-C in rush hour
Exchange Road	1 each way	Good		

* A = Unconstrained Traffic Flow
  B = Moderate Traffic Flow
  C = Constrained Traffic Flow

Area I – VWS

Navigational Approach Data and General Information

1) A Regulated Area exists from an unmarked approach point (Alpha Hotel) at the entrance to Apra Outer Harbor. The regulations for this area are published by the Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC) in DMAHTC Publication 126 or are made available by a weekly Notice to Mariners. Information concerning the regulations may be obtained at the office of the Commander, 14th Coast Guard District, Honolulu, Hawaii.

2) Additional Security Zones, Special Anchorage areas, Restricted Areas, Safety Zones, and Explosive Anchorage areas are present throughout Apra Outer Harbor.

3) Apra Inner Harbor is accessible via Apra Outer Harbor, through a shallow inlet, approximately 900 feet wide. Water depths within the inlet range from approximately - 35 feet mean lower low water (M.L.L.W.), to approximately - 49 feet M.L.L.W. Restricted Areas are also present within Apra Inner Harbor.

4) Apra Inner Harbor is relatively shallow with depths ranging from approximately - 30 feet M.L.L.W. to approximately - 47 feet M.L.L.W.

5) Navigational markers are present at the entrance to Apra Outer Harbor, near Spanish Rocks, and at the entrance to Apra Inner Harbor, near Polaris Point. Additional markers, buoys, etc., are present within Apra Outer Harbor and Apra Inner Harbor.

6) Chartered submarine pipelines, submarine cables, and submarine pipeline and cable areas are present in the vicinity of Apra Outer Harbor. Additional unchartered submarine pipelines and submarine cables may also exist within the area. Extreme caution is advised for mariners operating vessels in depths of water comparable to their draft in these areas. Covered wells may be marked by lighted or unlighted buoys.

7) Submerged Submarine Operating Areas are present at the entrance to Apra Outer Harbor and other designated areas. Extreme caution is advised as submarines may be submerged in these areas. Vessels should navigate in theses waters with considerable caution.

8) An Acoustic Range Facility with numerous shore connected bottom cables are known to be located within designated areas in the waters near the Apra Outer Harbor entrance channel and near Agat Bay.

9) Currents in Apra Harbor Entrance are as follows:
- Maximum flood current of 1.5 knots, setting North to Northeast.
- Maximum ebb current of 3 knots setting Southwest.
- Slack water occurs 30 minutes before low water and 45 minutes before high water.
- The prevalent set of the current in harbor entrance is generally to the South or Southwest regardless of the tide, but a set to the North or Northeast may be experienced, especially during the summer months.

10) Heavy westerly swells sometime make the entrance of Apra Outer Harbor dangerous for several days in a row. This condition occurs when a typhoon builds up in this area, progresses to NW and then curves to NE. Beacons and buoys are sometimes destroyed or carried away at such times.

11) Tides - Currents - The mean tidal range at Apra Harbor is 0.3m (1 ft.), while the spring range is 0.7 (2 ft.).

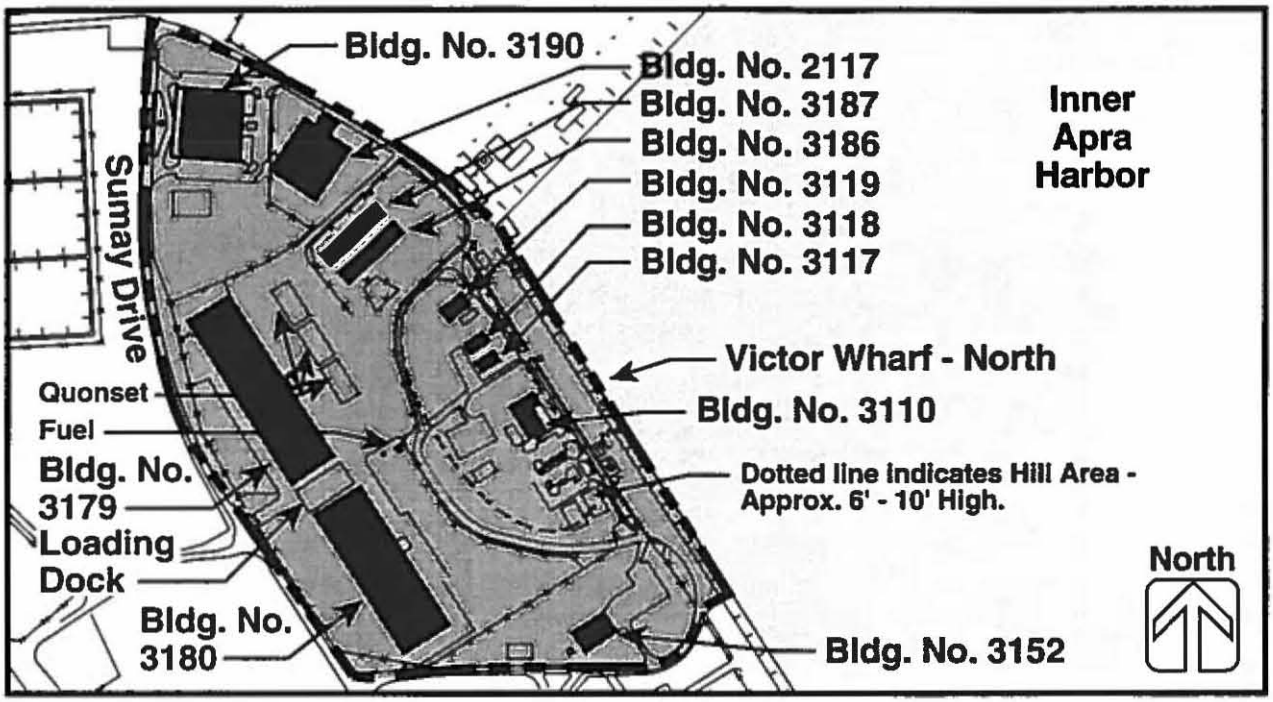
12) Information described herein was obtained from the National Oceanic and Atmospheric Administration (NOAA), Coast and Geodetic Survey, Pacific Ocean, Mariana Islands, soundings map #81054, dated April, 1993.

Inner Apra Harbor - South

Area II - VWN
(Victor Wharf North)

Location Map - Inner Apra Harbor - Victor Wharf North

Area II - VWN



Approximate Area II - VWN Acreage = 52 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
2117	FISC	HAZ MAT	44,000	Brand new, excellent. Curbs, tanks, drains, shelving systems
3179	FISC	General Warehouse #3	97,200	Old but good shape/ Approx. 20' clear ht.
3180	FISC	HAZ/FLAM Storage + General Warehouse #4	32,400+64,800 = 97,200	Old but good shape/ Approx. 20' clear ht.
3186	FISC	General Storage Shed	12,000	Open air
3187	FISC	General Storage Shed	12,000	Open air
3190	FISC	Administration Data Processing + FISC Headquarters Academic Instruction	25,760 + 1130 = 35,790	Good condition
3119	FISC	Diving Office	2,600	Appears good
3152	NAVACTS	U.S. NAVACTS Operations Dept.	11,200	Appears good
3110	NAVACTS	Seals Operation	8,200	Appears good
3117	NAVACTS	Seals	1,950	Metal Bldgs
3118	NAVACTS	Seals	1,950	Metal Bldgs

Area II - VWN
Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
Victor - North	NAVACTS	*1,350	24 - 29	Good recent repair of earthquake damage. Approx. 10 feet above MLLW.

* Berth length equals portion considered as part of Area II - Victor Wharf - North. Total wharf length = 3,465 feet, see also Area I - VWS. Total wharf length includes area designated for Coast Guard use.

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
V - North	Yes	Yes	Yes	Yes	Yes	No	Yes

Miscellaneous Wharf Characteristics

Wharf Name	No. of Cranes	Type	Approx. Capacity Tons	Fender Type	General Condition
Victor - North	None			Vertical rubber fenders	Some fenders in poor condition.

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Sumay Drive	1 each way	Fair	A	(B-C in rush hour)

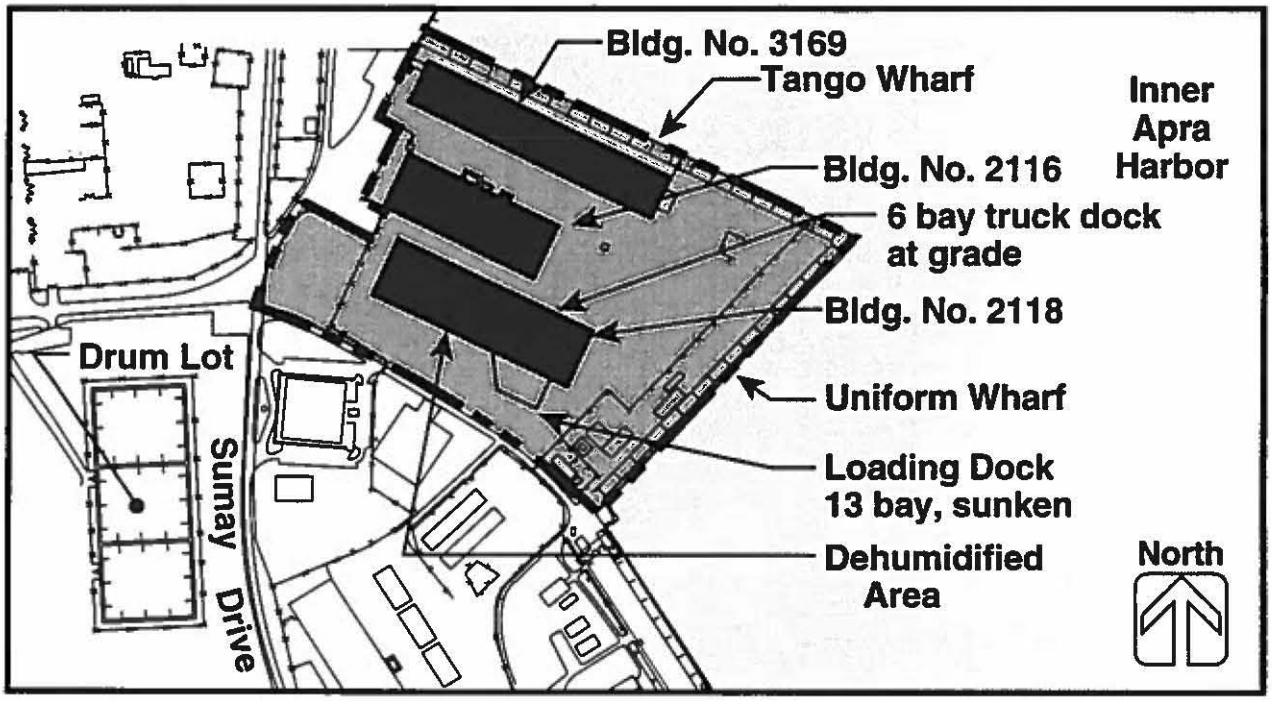
* A = Unconstrained Traffic Flow
  B = Moderate Traffic Flow
  C = Constrained Traffic Flow

Area II – VWN
Navigational Approach Data and General Information
(See Area I - VWS for a listing of Major Navigational Approach Issues.)

Inner Apra Harbor - South

Area III - TUW
(Tango/Uniform Wharf)

Location Map - Inner Apra Harbor - South **Area III - TUW**



Approximate Area III - TUW Acreage = 34 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
2116	FISC	General Warehouse + SERVMART	82,800+14,400 = 97,200	Servmart #2 approx. 20' clear ht.
2118	FISC	Warehouse #9 Integrated Storage	120,000	Brand new, excellent approx. 20' clear ht.
3169	FISC	Waterfront Transit Shed Freight Term Dept.	135,793	50' apron to wharf approx. 16' to 20' clear ht.

Area III - TUW
Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
Tango	FISC	1,495	24 - 29	Appears good.
Uniform	FISC	1,219	26 - 28	Approx. 10 ' above MLLW Wharf line bows out. 2' wide earth-quake cracks.

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
TANGO	Yes	Yes	Yes	Yes	not confirmed	No	Yes
UNIFORM*	Yes	Yes	Yes	Yes	not confirmed	No	Yes

* Uniform wharf utilities are assumd to be damaged.

Miscellaneous Wharf Characteristics

Wharf Name	No. of Cranes	Type	Approx. Capacity Tons	Fender Type	General Condition
Tango	None	NA	NA	Vertical rubber	Medium condition
Uniform	None	NA	NA	Wood fenders	Poor. Some fenders broken.

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Sumay Drive	1 each way	Fair	A	(B-C in rush hour)

* A = Unconstrained Traffic Flow
  B = Moderate Traffic Flow
  C = Constrained Traffic Flow

Area III – TUW
Navigational Approach Data and General Information

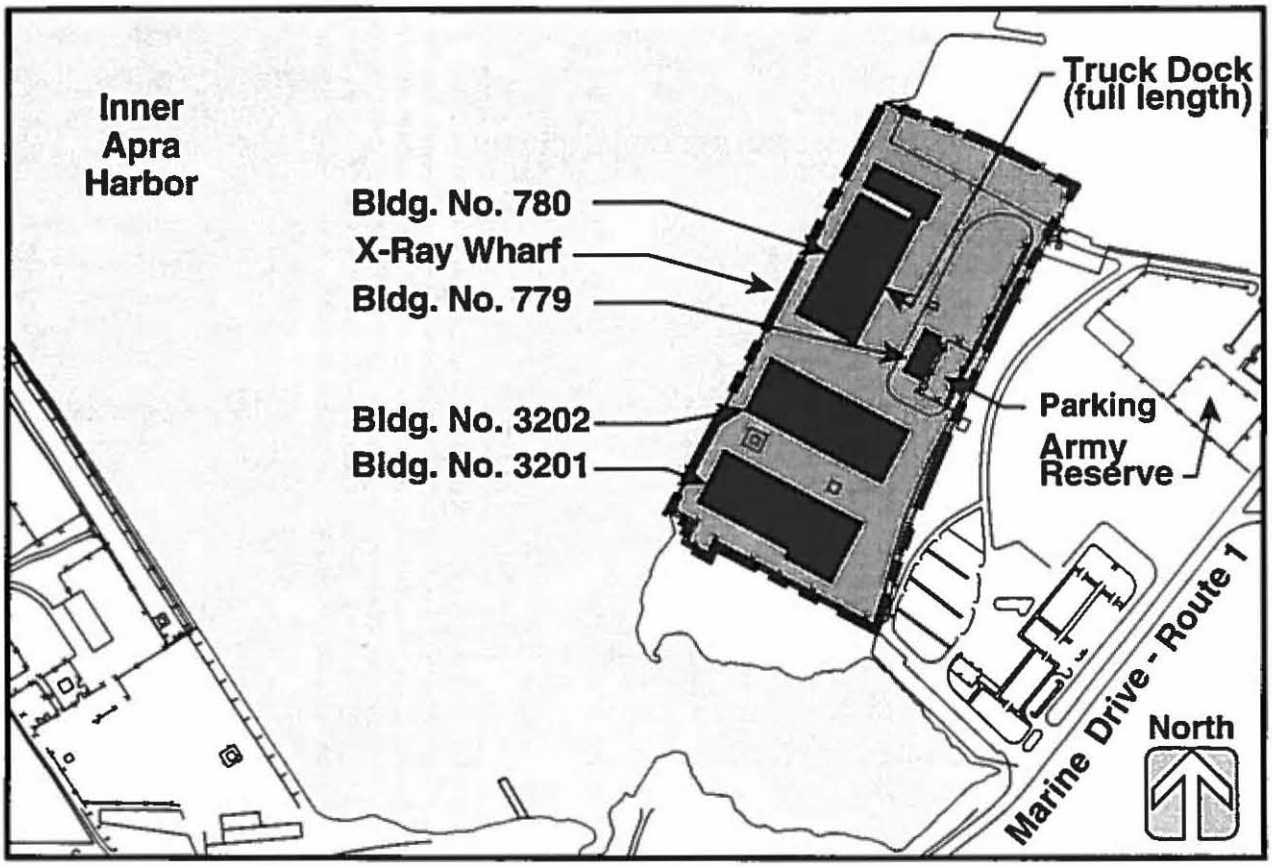
(See Area I - VWS for a listing of Major Navigational Approach Issues.)

Inner Apra Harbor - South

Area IV - XRW
(X-Ray Wharf)

Location Map - Inner Apra Harbor - South

Area IV - XRW



Approximate Area IV - XRW Acreage = 24 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
780	FISC	Cold Storage + Commissary Backup + Mechanical Room + Administration Office	41,822 + 21,080 + 15,758 + 2,440 = 81,100	Good Approx. 20' clear ht.
3201	FISC	Commissary Backup Storage + Exchange Central Warehouse #5 + General Warehouse	42,000 + 32,400 + 32,400 = 106,800	Good Approx. 20' clear ht.
3202	FISC	Commissary Back Storage + Controlled Humid Warehouse #6	31,600+54,800=86,400	Good Approx. 20' ht. clear ht.
779	FISC	Battery Locker	7,432	Good

Area IV - XRW

Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
X-Ray	FISC	1,500'	24 - 28	Excellent

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
X - RAY	Yes	No	Yes	No	No	No	No

Miscellaneous Wharf Characteristics

Wharf Name	No. of Cranes	Type	Approx. Capacity Tons	Fender Type	General Condition
X-Ray	None	NA		3 foot diam. pneumatic at approx. 25' on center	Excellent

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Marine Drive, Rt. 1	2 each way	Good	A	

* A = Unconstrained Traffic Flow
B = Moderate Traffic Flow
C = Constrained Traffic Flow

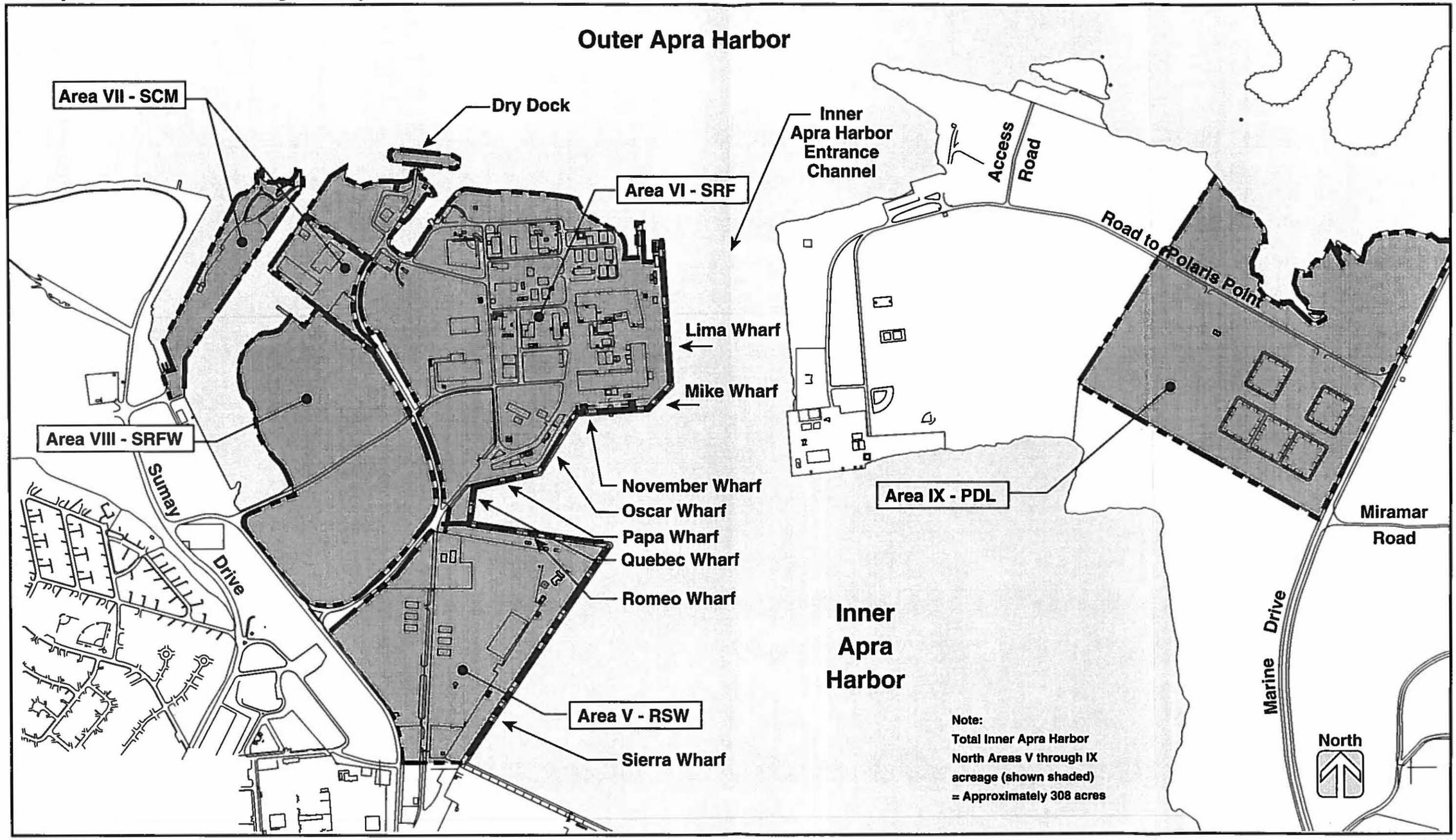
Area IV – XRW
Navigational Approach Data and General Information

(See Area I - VWS for a listing of Major Navigational Approach Issues.)

Inner Apra Harbor - North

Area V through Area IX (Including Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra Wharfs and the Dry Dock, and Polaris Point Drum Lot.)

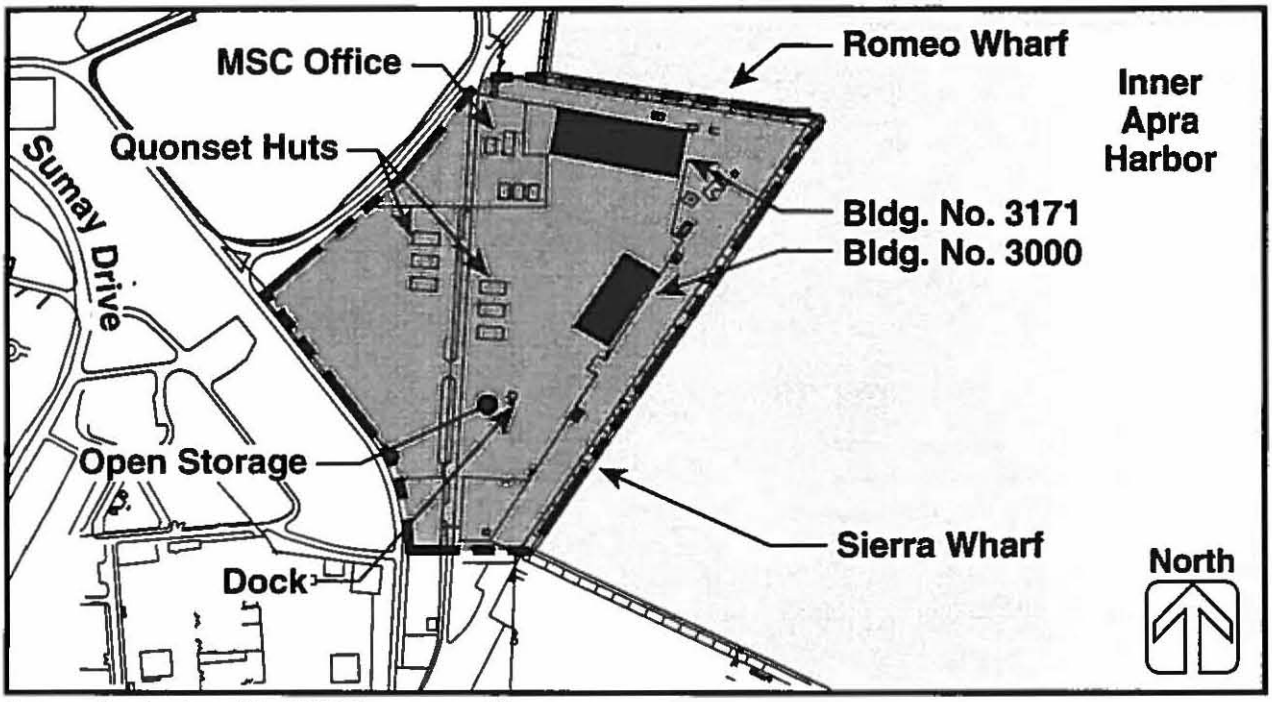
Inner Apra Harbor - North - Area Designation Map



Inner Apra Harbor - North

Area V - RSW
(Romeo and Sierra Wharfs)

Location Map - Inner Apra Harbor - North **Area V - RSW**



Approximate Area V - VWS Acreage = 52 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
3000	FISC	Transit Shed #3 Equip. Maintenence Bldg.	33,600	Appears new. Excellent condition Approx. 16' Clear ht.
3171	FISC	Waterfront Transit Shed	66,000	Average. Approx. 19' clear ht.

Area V - RSW

Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
Romeo	FISC	1050	30	Good
Sierra	FISC	2000	30	Recent repair, Very good.

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
Romeo	Yes	Yes	Yes	No	Yes	Yes	Yes
Sierra	Yes	Yes	Yes	No	Yes	No	No

Miscellaneous Wharf Characteristics

Wharf Name	No. of Cranes	Type	Approx. Capacity Tons	Fender Type	General Condition
Romeo	none	NA	NA	Rubber	Good
Sierra	none	NA	NA	Diagonal Rubber	Good

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Sumay Drive	1 each way	Fair	A	(B-C in rush hour)

* A = Unconstrained Traffic Flow
B = Moderate Traffic Flow
C = Constrained Traffic Flow

Area V – RSW
Navigational Approach Data and General Information

1) A Regulated Area exists from an unmarked approach point (Alpha Hotel) at the entrance to Apra Outer Harbor. The regulations for this area are published by the Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC) in DMAHTC Publication 126 or are made available by a weekly Notice to Mariners. Information concerning the regulations may be obtained at the office of the Commander, 14th Coast Guard District, Honolulu, Hawaii.

2) Additional Security Zones, Special Anchorage areas, Restricted Areas, Safety Zones, and Explosive Anchorage areas are present throughout Apra Outer Harbor.

3) Apra Inner Harbor is accessible via Apra Outer Harbor, through a shallow inlet, approximately 900 feet wide. Water depths within the inlet range from approximately - 35 feet mean lower low water (M.L.L.W.), to approximately - 49 feet M.L.L.W. Restricted Areas are also present within Apra Inner Harbor.

4) Apra Inner Harbor is relatively shallow with depths ranging from approximately - 30 feet M.L.L.W. to approximately - 47 feet M.L.L.W.

5) Navigational markers are present at the entrance to Apra Outer Harbor, near Spanish Rocks, and at the entrance to Apra Inner Harbor, near Polaris Point. Additional markers, buoys, etc., are present within Apra Outer Harbor and Apra Inner Harbor.

6) Chartered submarine pipelines, submarine cables, and submarine pipeline and cable areas are present in the vicinity of Apra Outer Harbor. Additional unchartered submarine pipelines and submarine cables may also exist within the area. Extreme caution is advised for mariners operating vessels in depths of water comparable to their draft in these areas. Covered wells may be marked by lighted or unlighted buoys.

7) Submerged Submarine Operating Areas are present at the entrance to Apra Outer Harbor and other designated areas. Extreme caution is advised as submarines may be submerged in these areas. Vessels should navigate in theses waters with considerable caution.

8) An Acoustic Range Facility with numerous shore connected bottom cables are known to be located within designated areas in the waters near the Apra Outer Harbor entrance channel and near Agat Bay.

9) Currents in Apra Harbor Entrance are as follows:
- Maximum flood current of 1.5 knots, setting North to Northeast.
- Maximum ebb current of 3 knots setting Southwest.
- Slack water occurs 30 minutes before low water and 45 minutes before high water.
- The prevalent set of the current in harbor entrance is generally to the South or Southwest regardless of the tide, but a set to the North or Northeast may be experienced, especially during the summer months.

10) Heavy westerly swells sometime make the entrance of Apra Outer Harbor dangerous for several days in a row. This condition occurs when a typhoon builds up in this area, progresses to NW and then curves to NE. Beacons and buoys are sometimes destroyed or carried away at such times.

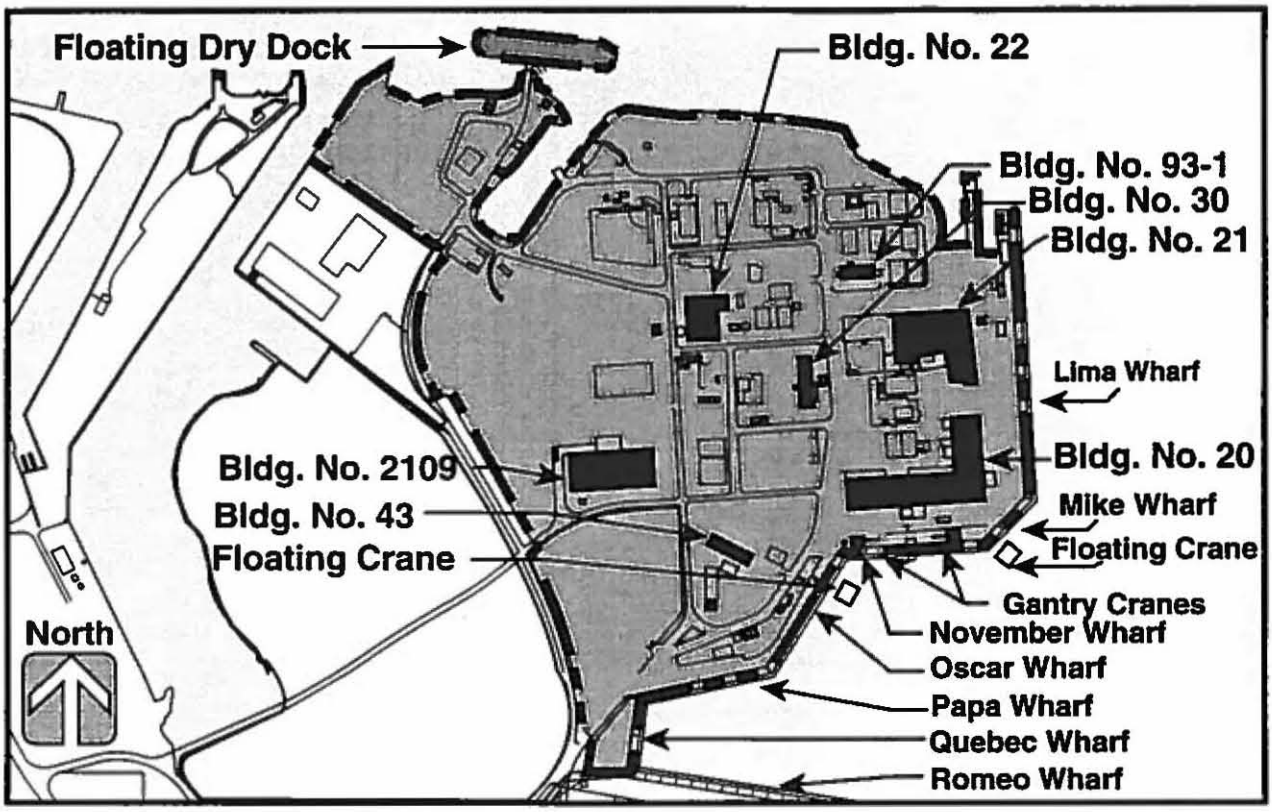
11) Tides - Currents - The mean tidal range at Apra Harbor is 0.3m (1 ft.), while the spring range is 0.7 (2 ft.).

12) Information described herein was obtained from the National Oceanic and Atmospheric Administration (NOAA), Coast and Geodetic Survey, Pacific Ocean, Mariana Islands, soundings map #81054, dated April, 1993.

Inner Apra Harbor - North

Area VI - SRF
(Ship Repair Facility Including Lima, Mike, November, Oscar Papa, Quebec Wharfs and the Dry Dock)

Location Map - Inner Apra Harbor - North **Area VI - SRF**



Approximate Area VI - SRF Acreage = 101 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
20	SRF	Administration Production Shops	138,670	
21	SRF	Production Shops	72,760	
22	SRF	Paint Sandblast Shop	26,400	
30	SRF	Foundry	11,880	
43	SRF	Supply Warehouse	9,000	
2109	SRF	Supply Warehouse DRMO	29,544	
93-1	SRF	Shipfitting, Welding Boilermaking, Pipefitting	12,222	

Area VI - SRF
Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
Lima	SRF	1100	30	Good
Mike	SRF	250	30	Good
November	SRF	500	32	Good
Oscar	SRF	550	29	Good
Papa	SRF	500	24	Good
Quebec	SRF	250	29	Good

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
Lima	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mike	Yes	Yes	Yes	Yes	Yes	Yes	Yes
November	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Oscar	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Papa	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quebec	Yes	Yes	Yes	Yes	No	Yes	Yes

Miscellaneous Wharf Characteristics

Wharf Name	No. of Cranes	Year Type	Approx. Capacity Tons	Fender Type	General Condition
Lima	Same as November, shared ganty rails.			Horiz. rubber	Medium condition
November	2	1941 & newer Gantry Cranes	33,600 lbs @97' & 11,200 @117'	Horiz. rubber	Medium condition
Mike	1	1969 Floating Crane	280,000 lbs. @1,000' & 33,600 lbs. @122.5'	Horiz. rubber	Medium condition
Papa	1	1944 Floating Crane	200,000 lbs. @ 80' & 11,200 lbs. @140'	Horiz. rubber	Medium condition

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Sumay Drive	1 each way	Fair	A	
Murray Road, 4th Street, Main Street, E Street	1 each way	Fair	A	

* A = Unconstrained Traffic Flow
B = Moderate Traffic Flow
C = Constrained Traffic Flow

Area VI – SRF
Navigational Approach Data and General Information

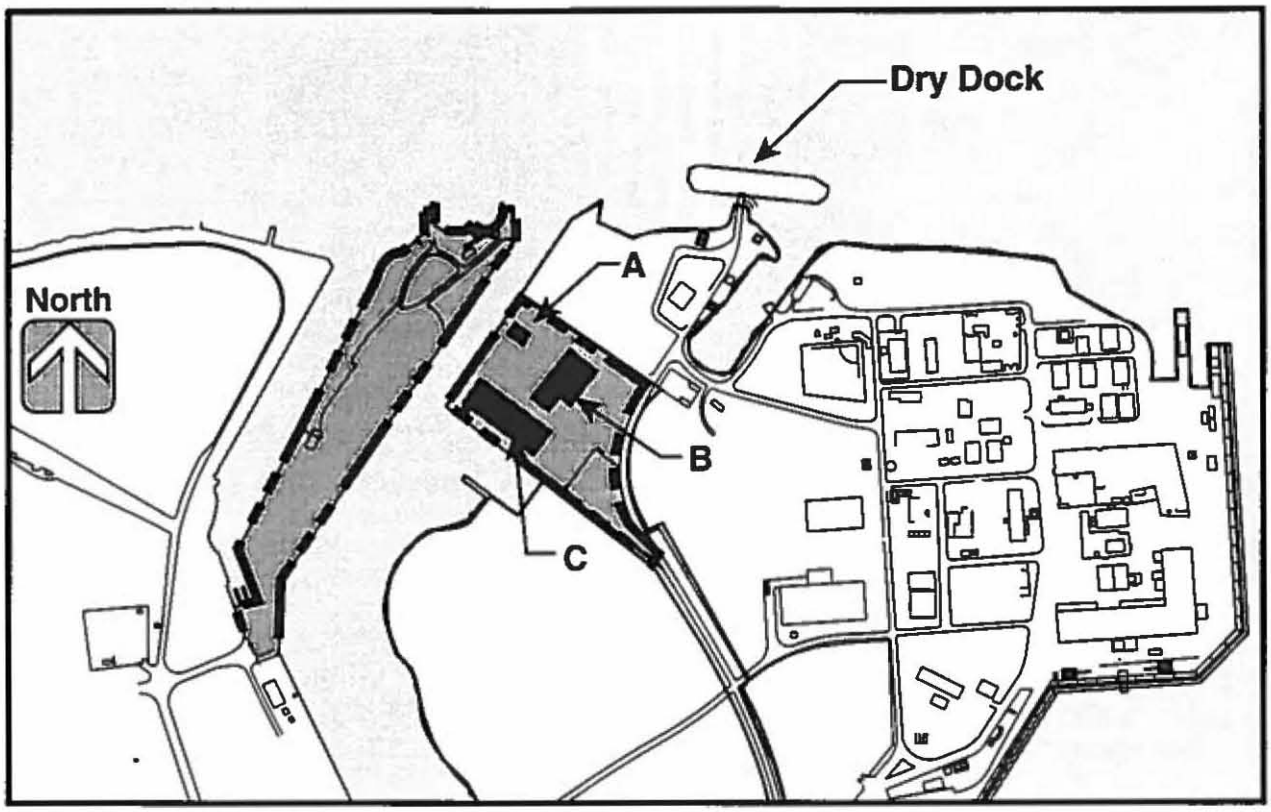
(See Area V - RSW for a listing of Major Navigational Approach Issues.)

Inner Apra Harbor - North

Area VII - SCM
Sumay Cove Marina

Location Map - Inner Apra Harbor - North

Area VII - SCM



Approximate Area VII - SCM Acreage = 20.5 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
A	NAVACTS	Explosives Ordinance Disposal Tower Training	16,000	Good
B	NAVACTS	Explosives Ordinance Disposal Operation	30,000	Good
C	NAVACTS	Explosives Ordinance Disposal Warehouse	40,500	Good

Area VII - SCM
Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
None	EOD	Approx. 800'	11' - 15'	Good

Miscellaneous Wharf Characteristics

Wharf Name	Current Navy Operations	No. of Cranes	Type	Approx. Capacity Tons	General Condition
None	NA	NA	NA	NA	NA

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Sumay Drive	1 each way	Fair	A	(B-C in rush hour)

* A = Unconstrained Traffic Flow
B = Moderate Traffic Flow
C = Constrained Traffic Flow

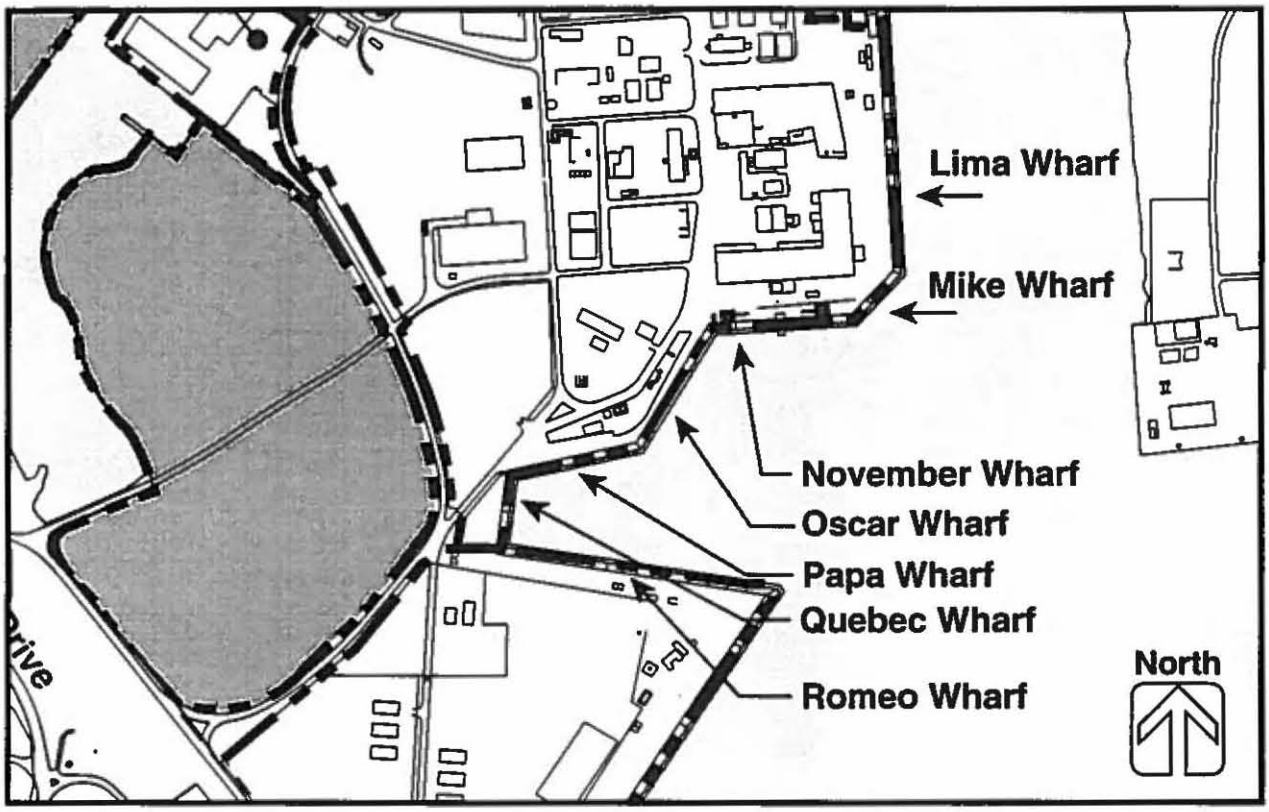
Area VII – SCM
Navigational Approach Data and General Information

(See Area V – RSW for a listing of Major Navigational Approach Issues.)

Inner Apra Harbor - North

Area VIII - SRFW (Ship Repair Facility Wetlands)

Location Map - Inner Apra Harbor - North **Area VIII - SRFW**



Approximate Area VIII - SRFW Acreage = 47 acres

***Building Inventory**

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
NA	SRF	NA	NA	NA

* This wetlands area is assigned to SRF, but not used for operations.

Area VIII - RFW

Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
NA	NA	NA	NA	NA

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Sumay Drive	1 each way	Fair	A	

* A = Unconstrained Traffic Flow
B = Moderate Traffic Flow
C = Constrained Traffic Flow

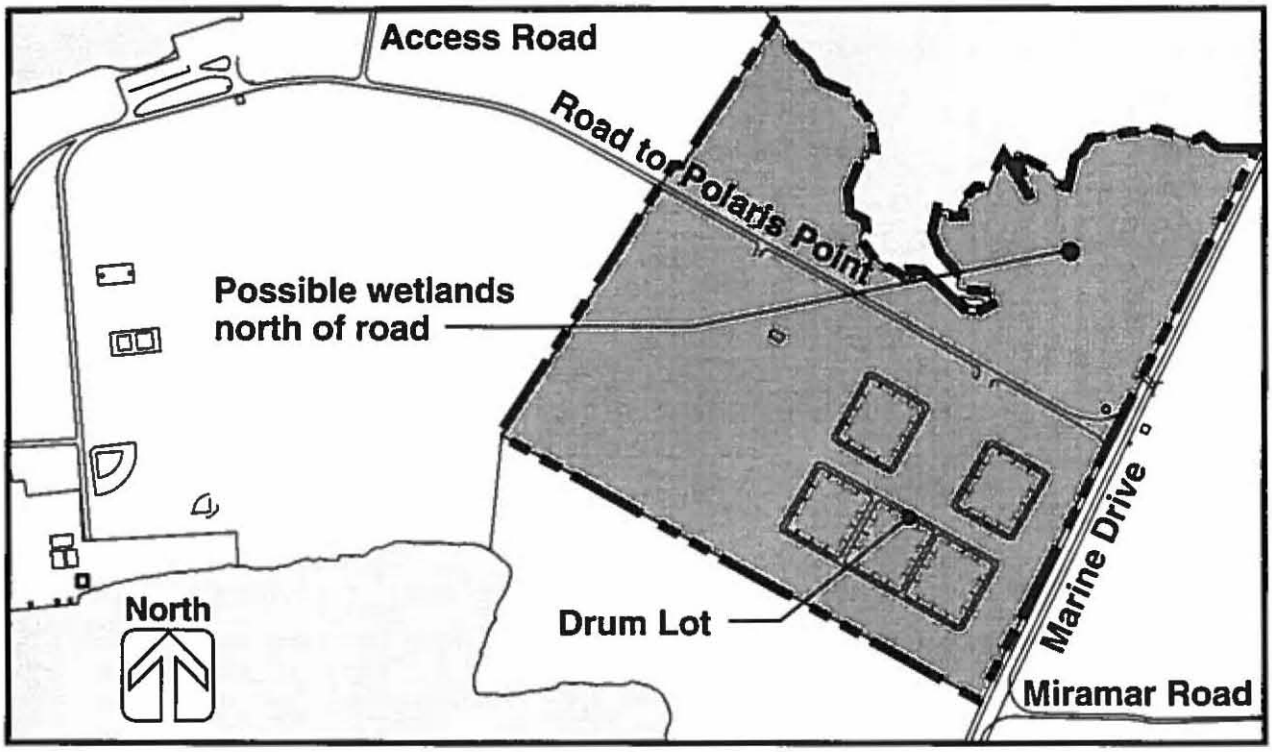
Area VIII – SRFW
Navigational Approach Data and General Information

(See Area V – RSW for a listing of Major Navigational Approach Issues.)

Inner Apra Harbor - North

Area IX - PDL
Polaris Drum Lot

Location Map - Inner Apra Harbor - North **Area IX - PDL**



Approximate Area V - VWS Acreage = 87 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
NA	Drum Lot	Not currently used	Approx. 25 acres	Poor to fair paving

Area IX - PDL

Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
NA	NA	NA	NA	NA

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Marine Drive	2 each way	Good	A	(B-C in rush hour)

* A = Unconstrained Traffic Flow
B = Moderate Traffic Flow
C = Constrained Traffic Flow

Area IX – PDL

Navigational Approach Data and General Information

1) A Regulated Area exists from an unmarked approach point (Alpha Hotel) at the entrance to Apra Outer Harbor. The regulations for this area are published by the Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC) in DMAHTC Publication 126 or are made available by a weekly Notice to Mariners. Information concerning the regulations may be obtained at the office of the Commander, 14th Coast Guard District, Honolulu, Hawaii.

2) Additional Security Zones, Special Anchorage areas, Restricted Areas, Safety Zones, and Explosive Anchorage areas are present throughout Apra Outer Harbor.

3) Apra Inner Harbor is accessible via Apra Outer Harbor, through a shallow inlet, approximately 900 feet wide. Water depths within the inlet range from approximately - 35 feet mean lower low water (M.L.L.W.), to approximately - 49 feet M.L.L.W. Restricted Areas are also present within Apra Inner Harbor.

4) Apra Inner Harbor is relatively shallow with depths ranging from approximately - 30 feet M.L.L.W. to approximately - 47 feet M.L.L.W.

5) Navigational markers are present at the entrance to Apra Outer Harbor, near Spanish Rocks, and at the entrance to Apra Inner Harbor, near Polaris Point. Additional markers, buoys, etc., are present within Apra Outer Harbor and Apra Inner Harbor.

6) Chartered submarine pipelines, submarine cables, and submarine pipeline and cable areas are present in the vicinity of Apra Outer Harbor. Additional unchartered submarine pipelines and submarine cables may also exist within the area. Extreme caution is advised for mariners operating vessels in depths of water comparable to their draft in these areas. Covered wells may be marked by lighted or unlighted buoys.

7) Submerged Submarine Operating Areas are present at the entrance to Apra Outer Harbor and other designated areas. Extreme caution is advised as submarines may be submerged in these areas. Vessels should navigate in theses waters with considerable caution.

8) An Acoustic Range Facility with numerous shore connected bottom cables are known to be located within designated areas in the waters near the Apra Outer Harbor entrance channel and near Agat Bay.

9) Currents in Apra Harbor Entrance are as follows:
- Maximum flood current of 1.5 knots, setting North to Northeast.
- Maximum ebb current of 3 knots setting Southwest.
- Slack water occurs 30 minutes before low water and 45 minutes before high water.
- The prevalent set of the current in harbor entrance is generally to the South or Southwest regardless of the tide, but a set to the North or Northeast may be experienced, especially during the summer months.

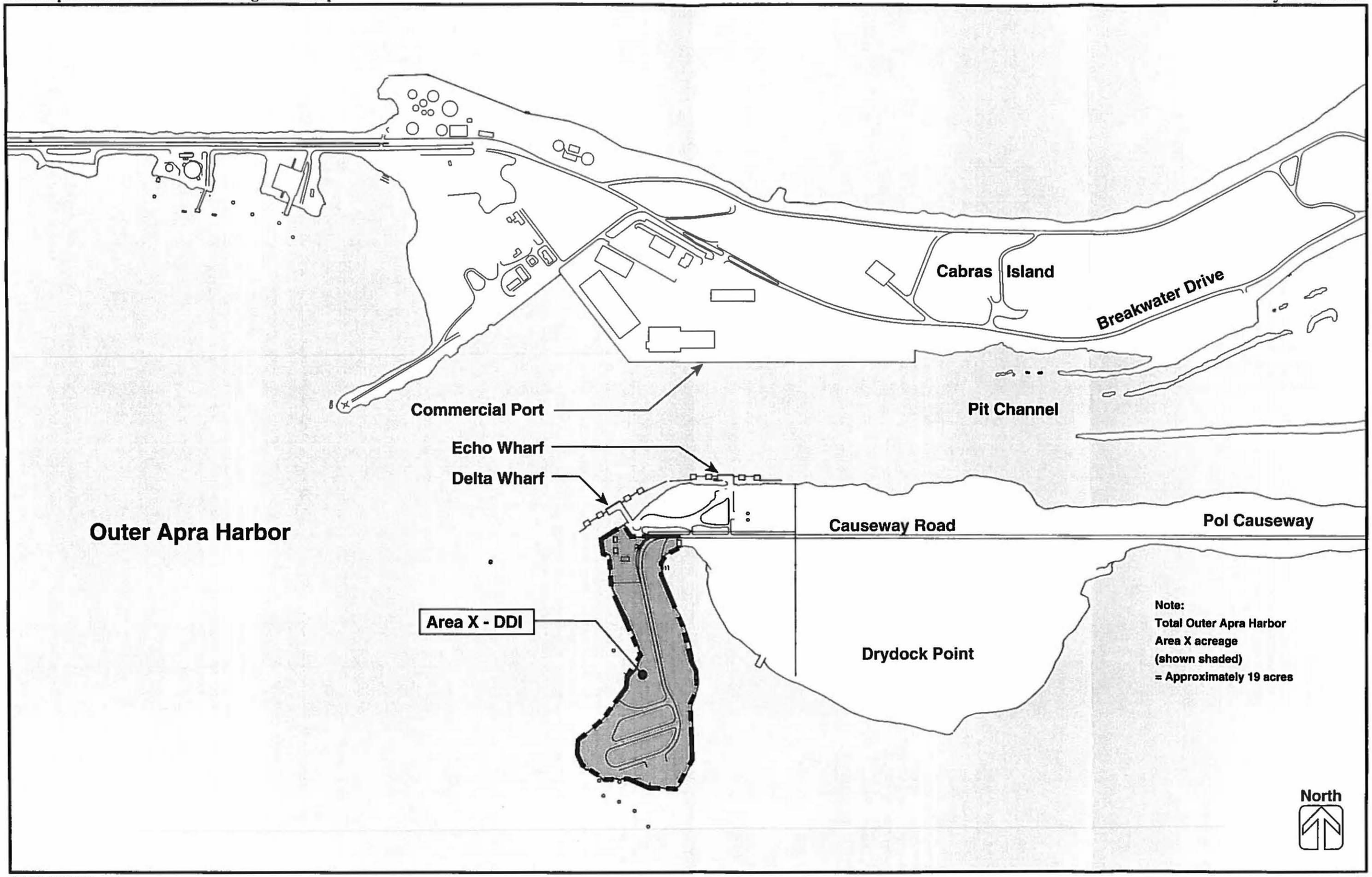
10) Heavy westerly swells sometime make the entrance of Apra Outer Harbor dangerous for several days in a row. This condition occurs when a typhoon builds up this area, progresses to NW and then curves to NE. Beacons and buoys are sometimes destroyed or carried away at such times.

11) Information described herein was obtained from the National Oceanic and Atmospheric Administration
(NOAA), Coast and Geodetic Survey, Pacific Ocean, Mariana Islands, soundings map #81054, dated April, 1993.

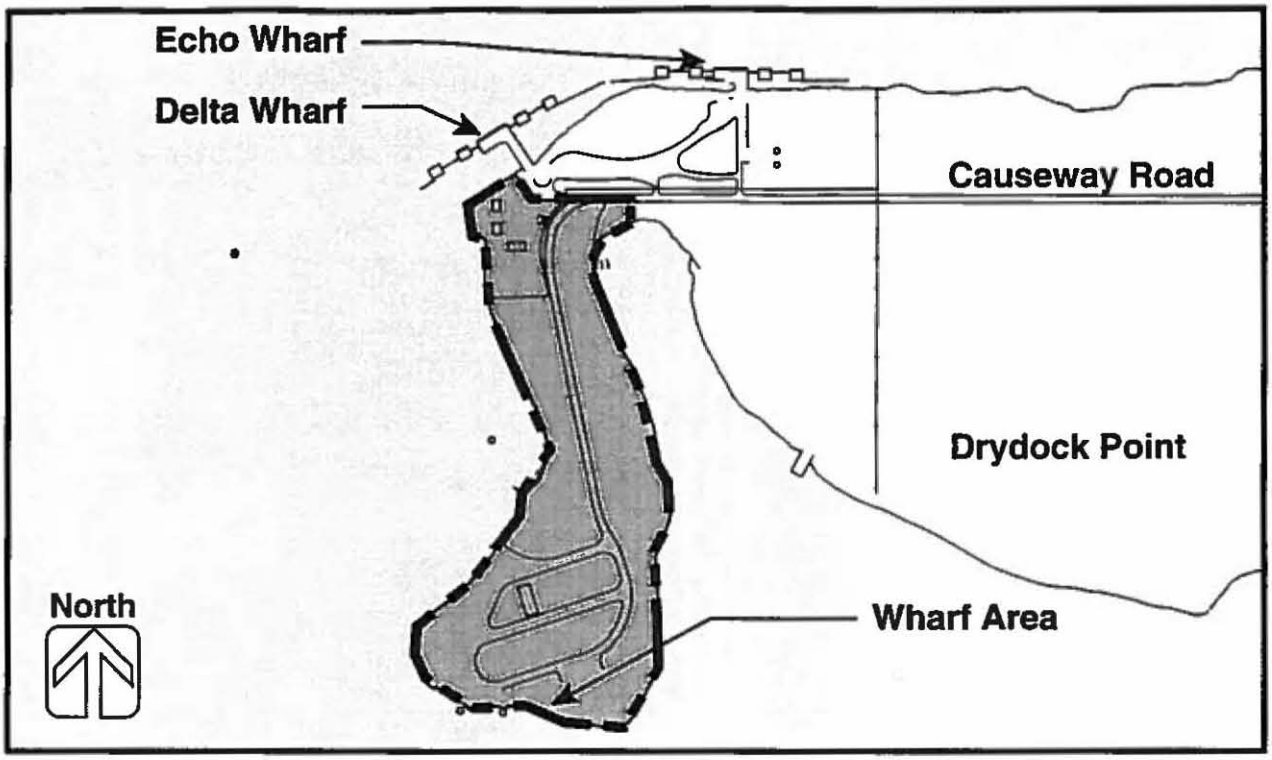
Outer Apra Harbor - East

Area X - DDI
(Dry Dock Island)

Inner Apra Harbor - East - Area Designation Map



Location Map - Outer Apra Harbor - East **Area X - DDI**



Approximate Area IX - DDI Acreage = 19 acres

Building Inventory

Bldg. No.	Current Navy Operation	Bldg. Description or Use	Square Feet	General Condition
NA	SRF	Small Recreational Structure Only	NA	NA

Area X - DDI

Wharf Characteristics

Wharf Name	Current Navy Operation	Berth Length (Feet)	Water Depth (Feet)	General Condition
None	Not Used	Appears to be approx. 100'	Shallow at face off wharf. 65-75' deep at 15' from face.	Very poor, may be unsafe

* Berth length equals portion considered as part of Area I - Victor Wharf - South. Total wharf length = 3,465 feet, see also Area II - VWN. Total wharf length includes area designated for Coast Guard use.

Wharf Utilities

Name	Electrical	Potable Water	Phone	Steam	Fire Water	Air	Salt Water
None	No	No	No	No	No	No	No

Miscellaneous Wharf Characteristics

Wharf Name	Current Navy Operations	No. of Cranes	Type	Approx. Capacity Tons	General Condition
None	NA	NA	NA	NA	NA

Highways, Traffic and Highway Constraints

Highway No. or Street Name	Number of Lanes	General Surface Condition	*Existing Service Conditions	Potential Constraints
Causeway Road	1 each way	Rough Paving	A	

* A = Unconstrained Traffic Flow
  B = Moderate Traffic Flow
  C = Constrained Traffic Flow

Area X - DDI

Navigational Approach Data and General Information

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10) Heavy westerly swells sometime make the entrance of Apra Outer Harbor dangerous for several days in a row. This condition occurs when a typhoon builds up in this area, progresses to NW and then curves to NE. Beacons and buoys are sometimes destroyed or carried away at such times.

11) Tides - Currents - The mean tidal range at Apra Harbor is 0.3m (1 ft.), while the spring range is 0.7 (2 ft.).

12) Information described herein was obtained from the National Oceanic and Atmospheric Administration (NOAA), Coast and Geodetic Survey, Pacific Ocean, Mariana Islands, soundings map #81054, dated April, 1993.

GMP
ASSOCIATES, INC.
Engineers/Architects

Appendix H

Utility Study

Appendix H
Utility Study

In December 1994, a Utility Technical Study (UTS) of the Navy's potable water and sanitary sewer systems at Guam was prepared for the Naval Facilities Engineering Command, Pacific Division. The Apra Harbor Naval Base was addressed in Volume I of that study. Most of the information from the UTS investigation is used as a reference for this report. For this study, the areas of concentration are specifically the Apra Harbor Naval Base (AHNB), the Drum Lot at Polaris Point, and Drydock Island (the vacant SRF portion).

The UTS concluded that the overall condition of the potable water infrastructure is good in terms of performance indicators such as condition of plant equipment, facilities, and pipelines; system capacity; and operating reliability.

In addition, the UTS concluded that the overall condition of the existing sewer system is fair. With the recent completion of secondary sewage treatment upgrades at the Apra Harbor Wastewater Treatment Plant and with implementation of other programmed military construction projects for pump stations, conditions should improve.

1 POTABLE WATER SYSTEM

1.1 Existing Potable Water System

The Fena Valley Watershed of the Naval Magazine area provides water to most naval facilities on Guam, as well as some civilian communities. This Navy-owned and operated water system utilizes three primary sources of water in the southern region: the Almagosa Spring, Bona Spring and the Fena Reservoir.

Spring water is highly dependent on rainfall, and the yield from both springs varies from 0.5 mgd in the dry season to 3.0 mgd in the wet season.

The Almagosa, the Imong, and Maulap Rivers drain 75 percent of the Fena Valley Watershed into the Fena Reservoir. This water impoundment has an active storage capacity of 2,100,000,000 gallons (6,445 acre-feet) for the zone between the pump intake and the dam spillway.

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The Fena Water Treatment Plant (FWTP) treats the combined spring and surface water using alum, lime, and polymer coagulants. Using sand and sand filtration purification processes, the plant can produce 13.5 of potable water. Current production varies between 10.5 mgd during the dry season and 12.5 mgd during the wet season. The treated water is stored in the clearwell for distribution to the NAVMAG, Maanot, Apra Heights and Tupo Reservoirs.

1.2 Island-Wide Water Transmission System

The Navy's island-wide potable water system consists of over 250 miles of main and secondary water lines, several wells in the northern service area, and twelve storage reservoirs with a combined storage volume of 20.5 MG. The water transmission mains vary in size from 30 inches to 12 inches in diameter; while the distribution lines vary from 10 inches to 6 inches in diameter. A network of five main balancing reservoirs located close to the principal naval activities on the island accommodates the fluctuating water demands of the service area. This network reaches from Naval Magazine in southern Guam to NAS Agana (now known as Tiyan) and RTF Barrigada in central Guam, and to NCTAMS WestPac in northern Guam.

1.3 Operation and Maintenance

The operation and maintenance of the FWTP, water transmission, and water distribution systems are under the command of Public Works Center (PWC) Code 660. Support for accomplishing repairs is provided by tradesmen of the PWC Transportation and Maintenance Departments.

1.4 Service Areas

1.4.1 Apra Harbor Naval Base

Water for the Apra Harbor Naval Base is supplied from the Fena Reservoir and Fena WTP through the 5.0 MG Apra Heights Reservoir and the higher elevation 5.0 MG Tupo Reservoir. The Apra Heights Reservoir serves most of the Naval Base, while the Tupo Reservoir feeds portions of the Naval Base's northern waterfront sector at Polaris Point and Drydock Island.

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Apra Heights Reservoir water is delivered to the main Naval Base through a 24 inch main (Main "B") along the Shoreline Drive (back gate) route. Distribution inside the AHNB is via 10" and smaller connections to 20" (Main "Q-1"), 10" (Main "Q-2"), 16" (Main "B"), 14", and 12" transmission mains. A 24" main (Main "Q-1") supplies potable water to consumers located outside the boundaries of the main AHNB in the area between the AHNB front gate and the PWC Administration compound.

Tupo Reservoir water is primarily exported to areas north of the AHNB, such as Nimitz Hill, Naval Hospital, Tiyan, RTF Barrigada, and Finegayan. However, the 24-inch mains (Mains "A-1 and A-2") running along route 5 (Naval Magazine Road) and Route 2A to the intersection of Route 1 (Marine Drive) provides water service to portions of the Apra Harbor Naval Base complex, namely at X-Ray Wharf, Polaris Point, Sasa Valley Fuel Farm, Drydock Island, and Cabras Island.

For emergency operations, a valved interconnection was installed between the 24-inch transmission mains of the Apra Heights and Tupo reservoir systems at the intersection of Route 2A (Agat Drive) and Route 1(Marine Drive). With this interconnection, either 24-inch transmission mains (Main "A-2" and "Q-1") can supplement the other. Normally, the main valve on this crossover connection is secured to isolate the Tupo Reservoir and the Apra Heights Reservoir transmission systems. In effect, under current normal operations, the Apra Harbor Naval Base is only fed by the Shoreline Drive 24" water transmission main. The 1993 average annual metered water consumption at AHNB was about 1.46 mgd.

Water service to the Victor Wharf area is provided by the Apra Harbor water network. There is a 12-inch cast iron pipe (Main "R") waterline that is laid parallel to the water front from the southern end in front of Toyland, and extending approximately two-thirds the entire length of Victor Wharf, where is connects to a 10-inch main ("CT") at building 3152. In addition, there are approximately 8 6-inch service taps to serve ships berthed along the wharf.

1.4.2 Drum Lot at Polaris Point

Water service to Polaris Point is provided via a 12-inch cast iron pipe that T-branches off the Tupo waterline on Marine Drive. This 12-inch waterline is laid along the south side of the Polaris Point Road. The former drum lot is located on the southwest corner of Marine

Drive/Polaris Point Road intersection. There are 8-inch distribution lines looped around the drum lot, but these lines are currently inactive.

1.4.3 Drydock Island

Drydock Island is also serviced with water from the Tupo Reservoir waterline along Marine Drive in Piti. A 12-inch cast iron pipe T-branches off the Tupo waterline at the Marine Drive/Route 18 intersection (Causeway Road). This 12-inch extends the entire length of Route 18 to provide water to the FISC fueling piers, Delta and Echo Wharves. In addition, this 12-inch waterline provides water to the Mariana's Yacht Club located on the Government of Guam property abutting the Navy property; the Port Authority of Guam beach; and the Small Boat/Harbor of Refuge area. These three service taps are billed to PUAG.

1.5 Metering and Valving Systems

Master meters are installed at strategic locations in the water transmission pipe network to register the water consumption of particular tributary areas. In the current arrangement, these meters tally the amount of water consumed by such commands as the SRF, FISC, NAVACTS, PWC, NAVMAG, and certain housing areas. Within the tributary area of these master meters, certain tenant commands, industrial activities, and utility plants are submetered to determine specific water usage and billing adjustments. About 27 master meters in the study area range in size from the Fena WTP's 36" meter to 8" and 10" compound meters at NAVMAG, PWC, SRF, NAVACTS, FISC, and housing areas. Roughly 75 submeters and other individual meters at specific facilities range in size from ⅝" to 2".

Main valves (or zone valves) on the transmission pipe network as large as 24" afford the operational flexibility to isolate a leg of a looped system or to shutdown a pipeline segment for maintenance or repair. Secondary valves (or section valves) provide a means to isolate a particular service area of water supply in the event of a waterline break. In addition, service (shutoff) valves exist on water laterals to permit isolation of any individual facility for interior plumbing work. No accurate count of the number of valves in the study area is available; however, for the Navy's island-wide potable water system, it is estimated that there are 150 main valves and 1008 secondary valves.

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1.5.1 Victor Wharf

The Victor Wharf area is currently not metered. The meters in the vicinity of Victor Wharf are for the tenant buildings and facilities such as the U.S. Coast Guard, Navy SEALS, and various NAVACTS buildings.

1.5.2 Drum Lot at Polaris Point

Service to buildings at Polaris Point is metered off the 12-inch waterline that serves the area. The abandoned drum lot at Polaris Point includes an inactive 1-inch meter that has served the former building in the area. There are no PUAG waterlines in the area. As stated earlier, the Navy provides water to the civilian community is the vicinity of the Tupo waterline along Marine Drive.

1.5.3 Drydock Island

Drydock Island has several Navy meters to tally the water serving the FISC fueling facilities as well as GovGuam meters to tally the water service at the recreational facilities such as the Marianas Yacht Club, and the Harbor of Refuge.

1.6 Fire Protection

Fire hydrants in the system are predominantly the wet barrel type. There are a few dry barrel type, such as at Camp Covington. Hydrants in the system typically have twin 2-½" nozzles and one 4-½" pumper truck nozzle connection, and are usually numbered for easy field reference. A PACDIV Fire Protection Survey Report dated 1988 identified fire flow deficiencies in some areas and recommended corrective measures. There were no fire flow deficient areas identified in the report for the Victor Wharf area, Polaris Point, nor Drydock Island.

Local federal fire departments do not routinely conduct fire hydrant flow tests. PWC Utilities Department personnel perform recurring maintenance, inspection, and repair to its hydrants and hydrant valves.

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1.7 Water Use Patterns

Daily water production records of the Fena Water Treatment Facilities show that weekday water use is normally greater than weekend demands by about 10 percent; and that Wednesday through Friday reflect days of highest water demands. This pattern is attributable to the transient (commuter) population working weekdays at the naval base and the sustained industrial and fleet support operations that primarily occur later during the week. These demands are in addition to the normal demands exerted by the family and bachelor resident population.

Periods of highest water usage occur between 0600 and 0800 hours and between 1700 and 1900 hours. In addition to the pronounced morning and evening peaks, a discernible mid-afternoon peak occurs at around 1500 hours during weekdays but of smaller magnitude. Lowest water demand occurs between 0100 and 0500 hours.

1.8 Water System Demands

The five year historical navy water consumption record from 1989 through 1993 lists all metered and unmetered consumers in Apra Harbor. Over this five-year period, the annual daily consumption fluctuated narrowly from 1.85 mgd in 1992 to 1.22 mgd in 1993 for AHNB. The average annual daily usage over this 5-year period was 1.61 mgd. In 1993, a total average day water consumption of 1.74 mgd was the lowest since 1983, Guam's worst drought season. This is largely attributable to fours weeks of forced water rationing and water outages caused by the August 1993 earthquake.

The low water consumptions occur during the months of June through August. This trend is related to Guam's annual wet season, normally lasting from July through November, and on the Navy's island-wide water conservation program, which may have been imposed any time between April and September. Comparing the annual average daily water demand during the past five years, water consumption was the lowest in 1993.

In general, it is estimated that about 70 percent of the total water demand at Apra Harbor is for domestic use and 30 percent is for industrial use. Housing and billeting activities alone account for about 60 percent of the water used at AHNB. These estimates are based on available consumption records.

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Utility Study

2 SANITARY SEWER SYSTEM

2.1 Description of Existing Sanitary Sewer System

The existing sanitary sewer system at the Apra Harbor Naval Base consists of gravity sewers and sewage pump stations that convey wastewater to the Navy-owned Apra Harbor Wastewater Treatment Plant (AHWWTP). The treated effluent is then discharged through an ocean outfall into Tipalao Bay.

The sewer system at Apra Harbor was originally developed, and still operates, as separate sewers for sanitary wastes and stormwater. The sanitary sewer system receives wastewater of domestic and industrial origin. The stormwater system consists of surface swales and ditches, along with roadway culverts. Most rain runoff either percolates through limestone strata or travels overland to vegetated sump areas or wetlands.

2.2 Present Sanitary Sewer System

With construction of the Apra Harbor primary sewage treatment plant in 1976, the former Orote Pump Station No. 1 was abandoned and sewage flows were redirected to the new treatment plant at Marine Drive. A new segment of effluent force main connected the plant to the existing 18-inch force main near the Orote Pump Station; and the 24-inch outfall at Tipalao was extended from its original point of discharge at the shoreline into deeper offshore waters.

In addition, several pierside Ship Wastewater Collection Ashore (SWWCA) pump stations were constructed, along with most of the present sewer system improvements at NAVMAG and Polaris Point, to convey wastewater to the new plant. In 1981 and 1989, additional SWWCA systems were constructed at SRF, Polaris Point, and Kilo Ammo Wharf. Recently the AHWWTP secondary treatment upgrade was constructed under MCON P-141. At the present time, there is an on-going construction project at AHWWTP to expand the plant, under MCON P-239P.

2.3 Operation and Maintenance

Operation and maintenance of the AHWWTP and sewage collection and transmission system is under the cognizance of PWC code 660.

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The utility rate for sewage commodity is $2.40 per kgal for FY94. Sewer charges are based on a sewage generation formula amounting to 70 percent of the potable water consumption.

2.4 Service Areas

Service areas for AHWWTP include AHNB, Polaris Point, Camp Covington, Apra Heights Navy Housing, and NAVMAG. The AHNB includes the administrative, operational, and industrial facilities of the SRF, FISC, NAVACTS, and PWC and its tenant commands. In addition, shipboard activities and billeting (family housing, bachelor officers, and bachelor enlisted men quarters) comprise the AHNB service area. Navy owned facilities at Cabras Island are served either by PUAG's Commercial Port WWTP or the Agana WWTP.

Unlike the Navy water supply system, the Navy sewerage system does not serve any civilian communities (except for a few commercial establishments that abut the base on Marine Drive).

The PUAG owns and operates the 1.5 MGD Agat WWTP located at Gaan Point. This facility provides activated sludge treatment for wastewater collected from developed areas of Agat and Santa Rita.

2.5 Collection and Transmission Systems

2.5.1 Collection System

The AHWWTP sewer tributary is comprised of approximately 35 miles or 280 inch-miles of gravity lines ranging from 6-inches to 36-inches in diameter. Pipe materials consist of vitrified clan (VC), cast iron (CI), concrete (CP), asbestos cement (AC), and polyvinyl chloride (PVC).

2.5.2 Manhole Construction

Manhole construction varies from precast sections of newer installations to brick and mortar manholes installed in the 1950's and 1960's. Manholes typically have no rungs to prevent unauthorized personnel from entering. Frames and covers are standard to heavy

duty cast iron lids, with most covers being of the solid lid design having pickholes. Manhole depths vary from 3.5 feet to as deep as 16 to 18 feet in various areas.

2.5.3 Overflow Sewers

The collection system along areas surrounding the Inner Apra Harbor has three points of emergency overflow discharge. A 12-inch overflow lines originates at SPS No. 18 and outlets at Papa Wharf. A second 16-inch overflow line originates at SMH D-4 off Sumay Drive and outlets at the Sierra Wharf No. 4 berth. The third overflow line is a 36-inch line which connects from SMH B-14 in the vicinity of the base front gate and terminates at the Victor Wharf No. 4 berth. Should SPS No. 18, No. 16, or the influent lift pumps at the AHWWTP cease operation, sewage bypasses will occur at these emergency disposal points, respectively.

2.5.4 Waterfront Sewers

Sections III of the Revised Guam Water Quality Standards prohibits the discharge of sewage from vessels while moored, berthed, docked, or underway in waters of the Territory except through a properly functioning Coast Guard approved Type II Marine Sanitation Device (MSD).

To eliminate overboard discharges, ship-to-shore collections sewers were constructed in three separate increments during 1976, 1981, and 1989. Vessels moored in the harbor use pierside hose hookups to transfer shipboard collection and holding tank (CHT) wastes for treatment and disposal ashore.

2.5.5 Sewage Lift/Pump Stations

The AHWWTP tributary consists of 20 sewage lift/pump stations in three general classes: 1) lift; 2) force main, and 3) SWWCA. Lift stations generally have very short force mains and are used solely to elevate sewage uphill to that point for shallower gravity flow. Force main stations are used to convey sewage uphill over long horizontal distances. SWWCA stations collect wastewater pumped from ships and convey it into a gravity system.

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None of the stations in the AHWWTP tributary are equipped with any type of flowmeter, totalizer, or recorder to provide information on dry and wet weather pumpage. At best, certain stations only have running meters.

2.5.5.1 Victor Wharf Area. SPS No. 14 is an SWWCA type station located at Victor Wharf. Built in 1976, the station serves the Coast Guard berthing. The stations uses a concrete wet well and a single pump with motor mounted at grade. A 2 HP motor is enclosed within a small stainless steel cage housing. The pump is a wet pit, vertical centrifugal unit rated at 50 gpm. The on/off sequence is controlled by a float rod switch. The motor control panel is mounted about 30 feet away from the wet well on a utility pole and features constant speed controls and a HOA switch. The pump conveys wastewater in a 4-inch diameter PVC force main to SPS No. 15.

SPS No. 15 is a force main station located at the back gate to the Orote Power Plant off Sumay Drive. The station receives wastewater generated from the surrounding Coast Guard areas as well as from SPS No. 14. Similar in construction to SPS No. 14, the station has a concrete well and one wet pit vertical centrifugal pump rated at 400 gpm at 50 feet. A 15 HP motor is enclosed in a small stainless steel housing mounted atop the wet well. Operation of the pump is controlled by a float rod switch. The control panel is mounted next to the wet well and features constant speed controls and a hand-off-auto (HOA) switch. The pump discharges through a 6-inch steel pipe force main which conveys wastewater to a manhole on Sumay Drive.

SLS No. 23, another SWWCA lift station, is located at the southern end of Victor Wharf and handles shipboard wastes at a the southern third of Victor Wharf. Like other SWWCA stations, this stations was constructed in 1976 with concrete dry and wet wells, three vertical centrifugal pumps rated at 450 gpm at 20 feet and 870 rpm, and 5 HP motors controlled by an air bubbler system. The control panel in the drywell contains constant speed controls, HOA switches, and motor runtime meters. A common header connects to an 8-inch diameter force main which discharges into a manhole approximately 45 feet from the station. In addition, the station has a 4-inch diameter emergency bypass line.

2.5.5.2 Polaris Point Area. In the Polaris Point area, there are three underground stations. SPS No. 7 is an SWWCA-type station which serves wharves Alpha and Bravo. In 1981, a 7000 gallon underground tank was added to enlarge the wet well volume. The present station was constructed in 1990 to replace a prefabricated pump station that was

abandoned adjacent to the current one. The current station is equipped with three vertical centrifugal pumps which are rated at 325 gpm against 42 feet of head at 1745 rpm. The pumps are installed within a concrete dry well and have 10 HP close-coupled motors activated via an air bubbler liquid level sensor. Each pump has an outlet diameter of 6-inches and discharges into a common header. This header connects to a 6-inch diameter force main which discharges into a gravity line leading to SPS No. 9. The motor control panel is mounted within the drywell and features constant speed controls and HAO switches for each pump unit. In addition, there are motor runtime meters for each unit.

SLS No. 8 serves several small buildings, including the yacht club, enlisted men's club, and a Navy Exchange service outlet. The station, installed in 1975, is a hydro-pneumatic, prefabricated lift station. Two 2 HP air compressors eject sewage at 30 gpm against a head of 10 feet into the same manhole as SPS No. 7.

SPS No. 9 is a force main station that transmits all wastewater generated from SPS No. 7 and SLS No. 8 to a manhole located inside the Apra Harbor Naval Base near the main gate. The station consists of three vertical centrifugal pumps at 475 gpm against a head of 94 feet. Each pump is powered by a 25 HP motor mounted atop each unit. Pump operation is controlled by an air bubbler liquid level sensor. Like SPS No. 7, the pumps have 6-inch discharge diameters which converge via a header to an 8-inch diameter force main. The motor control panel for the station is mounted at grade within a concrete enclosure cooled by a window-type window air conditioning unit. The controls are for constant speed operation and include HOA switches and motor runtime meters for each unit. Adjacent to the current station is an open-sided structure which was originally constructed to store caustic or oxidizing chemicals and injection equipment used for odor control at the station.

2.5.5.3 Drydock Island. There is no wastewater collection system on Drydock Island. The existing Navy facilities located at Drydock Island are connected to septic tank and leaching field. In addition, and GovGuam customers on Drydock Island such as Marianas Yacht Club, Harbor of Refuge are also connected to septic tank with leaching field.

2.6 Waterfront Infiltration

Because the sewers laid along the waterfront are located at depths near the harbor water surface, Victor Wharf was surveyed for infiltration during high tide, for the UTS study.

Appendix H
Utility Study

Victor suffered extensive longitudinal cracks generated from the August 8h earthquake, and it was suspected any sewer breaks in these areas would experience infiltration. Proceeding along Victor wharf, manhole covers were systematically opened to ascertain flow character and conditions. Because only berthed ships discharge into these sewers, any flow observed in lines at empty berths were presumed to be infiltration.

The survey revealed only small amounts of infiltration occurring. Along Victor Wharf, sewerlines feeding SLS No. 22 had some standing water, indicating that these lines may have some solids deposition. Further along Victor Wharf, small amounts of clear flow (approximately 10 gpm) was observed in the sewerlines feeding SLS No. 23. This observation was confirmed by a television inspection, which noted several leaking joints along this section of pipe. In addition, infiltration is suspected to occur in the SLS No. 23 wetwell.

Overall, infiltration appears to be confined mainly to the area near Victor Wharf , while infiltration along other wharves is not deemed excessive.

GMP
ASSOCIATES, INC.
Engineers/Architects

Appendix I

Selected Asian Shipyards

Appendix I
Selected Asian Shipyards

Indonesia

PAL INDONESIA

Established in 1939 as "Marine Establishment" (ME), PAL INDONESIA is one among the largest and most modern shipbuilding industries in the Southeast Asia region. In 1949, it was assumed by the Indonesian Government and was renamed "Penataran Angkatan Laut' (PA). Since 1980 it has been called PT, Pabrik Kapal Indonesia under the coordination of the Agency for Strategic Industries (BPIS).

PAL INDONESIA offers a wide range of services including design and production of naval and merchant vessels, shoreside steel structures, off-shore rigs, diesel engines, large power generation facilities and chemical plants.

NAVAL VESSELS : PAL Indonesia specializes in the production of 450-ton-Fast Patrol Boats, 2,500-ton-Frigates, 600-ton-Mine-Hunters and 1,200-ton-Submarines; also the exceptional 120-ton-fast-Jetfoil. Many of these designs originated from technology transfer agreements with various countries such as the USA, Germany and Belgium. PAL's integrated design and engineering workshops quickly and efficiently adapt existing designs to tailor and make a ship that meets customer requirements.

MERCHANT SHIPS : PAL Indonesia's pursuit of developing commercial ships has led to product lines ranging from modern cargo vessels to large wind-powered coasters. Some of these designs are based on technological transfer from world-class shipbuilders in Japan and Europe. For example, the Caraka Jaya class bulk carrier/container vessel, designed and developed at PAL, is highly effective in serving smaller ports as a feeder service to major embarkation points. General tugboats, utility vessels and tankers up to 6,500 DWT are also fabricated by PAL for offshore supply and general port duties. LPG carriers of 5,700 tons are also being developed. Additionally, PAL designed and developed the Maruta Jaya class, a state-of-the-art environmentally-conscious wind powered (sail) propeller assisted vessel. PAL's newly-constructed state-of-the-art of ship building facilities provides the capability to build tankers, bulk carriers and container vessels up to 50,000 tons.

Appendix I
Selected Asian Shipyards

MAINTENANCE & REPAIR : A wide variety of maintenance and over-hauling can be undertaken by PAL including repairs to advanced electronic warfare systems, and other ship components; refitting, and general repairs to hulls, superstructure, main engines and propeller shafts can be undertaken with complete confidence. PAL has signed several licenses and cooperation procedures with well-known diesel and steam turbine manufactures from Japan, Germany and the USA.

GENERAL ENGINEERING : Equipped with a host of modern industrial machineries, PAL Indonesia fabricates products ranging from small vessels to components for steam turbine power plants. PAL's General Engineering Division also produces a range of products that includes steam turbines, oil rigs, engines, cranes, steel structures, and ship components such as hydraulic gears, gear boxes and propellers.

FACILITIES & CAPABILITIES : PAL's production facilities cover an area of 150 hectares, one of the largest shipbuilding facilities in Southeast Asia. PAL's workforce numbers 6,000 highly skilled workers. PAL's facilities include : Hull Construction workshops; Outfitting Workshops; 50,000 DWT Dr Dock; 20,000 DWT Dr Dock (Dock Irian); 5,000 TLC Floating Dock (Dock Pare-Pare); 1,500 TLC Floating Dock (Dock Surabaya); 1,000 TLC Floating (Dock Kotaraja); 1,000 TLC Cassion Docks (two) (Docks Yogyakarta & Lawang); 1,500 TLC Ship lift and 1,000 DWT Slipwa/Gravit Dock.

COMPUTER FACILITIES : PAL's Computer Center utilizes DEC/VAX-750 and IBM 3083 and 3090 computers and design software (CAD/CAM). These state-of-the-art facilities are operated by PAL's experienced engineers to design ships, steam turbines, oil rigs, engines, and ship components that include hydraulic gears, gear boxes and propellers to PAL customers specific design specifications.

EDUCATION & TRAINING : To develop and improve the quality of skilled manpower, PAL not only provides the quality of skilled manpower with the necessary facilities, but has also developed vocational training programs. These programs include: shipbuilding, welding, boat building, electrical, mechanical and carpentry training. Each training program is designed to meet the students' and clients' requirements. PAL's training facilities have been able to train 1,000 students simultaneously.

Source : INDONESIA 1994 by Department of Information Republic of Indonesia

Appendix I
Selected Asian Shipyards

Japan

Hitachi Zosen Corporation, Osaka, Japan

Hitachi Zosen Corporation (HZC) specializes in shipbuilding, repairs and conversions of ships with a long history of quality products for both domestic and overseas markets. HZC's product line includes ordinary merchant ships, high-speed passenger boats, pleasure boats, offshore structures and waterside structures. While crude oil carriers and bulk carriers are the mainstay in HZC's standard merchant ship category, they maintain the capability to cope with other kinds of merchant vessels through their flexible state-of-the-art shipyards.

In the category of high-speed passenger boats and pleasure boats, HZC's driving force is the design and construction of hydrofoils that have founded an era of high-speed passenger ships in Japan. HZC is developing and building the SUPERJET, winged catamaran high-speed boats designed to satisfy requirements for high speeds and passenger's comfort. HZC is the first shipbuilder in the industry to supply the pleasure boat industry with large aluminum motor yachts, the "ultimate" pleasure boats for marine leisure. These yachts were developed through HZC's aluminum and wood technology gained through production of hydrofoils and pleasure boats for use on Lake Ashi and Lake Biwa. Other activities in this field include: production of offshore structures, such as oil rigs and platforms; floating breakwaters and steel fishing banks for fishery industry; marine resort facilities; and other waterside structures. Production and sale of innovative labor-saving welding robots are a specialty part of this category.

HITACHI ZOSEN CORPORATION OFFICES:

Head Office:
3-28 Nishikujyo 5-chome, Konohana-ku, Osaka 554, Japan
Phone:(81)6-466-7500
Facsimile:(81)6-466-7572
Telex: 63376 SHIPYARD J

Appendix I
Selected Asian Shipyards

Tokyo Office:
7th Floor Palaceside Building
1-1, Hitotsubashi 1-chome, Chiyoda-ku, Tokyo 100, Japan
Phone:(81)3-3217-8418
Facsimile:(81)3-3217-8545
Telex: 24490 SHIPYARD J
(Export business departments are situated in this office)

Sapporo Office:
3, Higashi 1-chome, Minami 1-jo, Chuo-ku, Sapporo 060, Japan
Phone:(81)11-231-2215

Sendai Office:
6-1 Tsutsujigaoka 4-chome, Miyagino-ku, Sendai, Miyagi 980, Japan
Phone:(81)22-295-3450

Nagoya Office:
10-27 Meieki 4-chome, Nakamura-ku, Nagoya 450, Japan
Phone:(81)52-581-0161/6

Niigata Office:
2-25, Higashi-odori 1-chome, Niigata 950, Japan
Phone:(81)25-247-3386

Hiroshima Office:
13-14, Nobori-cho, Naka-ku, Hiroshima 730, Japan
Phone:(81)82-227-1661

Takamatsu Office:
3-17, Ban-cho 3-chome, Takamatsu, Kagawa 760, Japan
Phone:(81)878-35-1844

Fukuoka Office:
2-1, Hakata-ekimae, 3-chome, Hakata-ku, Fukuoka, 812 Japan
Phone:(81)92-441-1644

Kobe Office:
32, Akashi-cho, Chuo-ku, Kobe 650, Japan
Phone:(81)78-331-6512

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Selected Asian Shipyards

Chikko Office:
2-11, Funamachi 2-chome, Taisho-ku, Osaka 551, Japan
Phone:(81)6-551-2264

Technical Research Institute:
2-11, Funamachi 2-chome, Taisho-ku, Osaka 551, Japan
Phone:(81)6-551-9101
Facsimile:(81)6-551-9642

Plant & Machinery Design Office:
3-40, Sakurajima 1-chome, Konohana-ku, Osaka 554, Japan
Phone:(81)6-465-3018
Facsimile:(81)6-465-4000
Telex: 63846 HZ SEK J

Information Systems Department Office:
Century Building
4-16, Kyomachibori 1-chome, Nishi-ku, Osaka 550, Japan
Phone:(81)6-449-8861
Facsimile:(81)6-449-8865
(Information Systems Department is situated in this office)

Ariake Works:
1, Ariake, Nagasu-machi, Tamana-gun, Kumamoto 869-01, Japan
Phone:(81)968-78-1110
Facsimile:(81)968-78-0892
Telex: 764427 HZ ARI J

Maizuru Works:
1180, Amarube-shimo, Maizuru, Kyoto 625, Japan
Phone:(81)773-62-8700
Facsimile:(81)773-62-3007
Telex: 5734-441 HZ MAI J

Kanagawa Works:
4-1, Mizue-cho, Kawasaki-ku, Kawasaki, Kanagawa 210, Japan
Phone:(81)44-288-1148
Facsimile:(81)44-276-0022
Telex: 3842-524 HZ KAN J

Appendix I
Selected Asian Shipyards

Innoshima Works:
2477-16, Habu-cho, Innoshima, Hiroshima 722-23, Japan
Phone:(81)8452-2-1220
Facsimile:(81)8452-2-8774
Telex: 6499-91 HZ INN J

Mukaishima Works:
14755, Mukaihigashi-cho, Onomichi, Hiroshima 722, Japan
Phone:(81)848-44-1111
Facsimile:(81)848-44-1518

Sakai Works:
5, Chikko-shinmachi 1-cho, Sakai, Osaka 592, Japan
Phone:(81)722-43-6801
Facsimile:(81)722-43-6839

Sakurajima Works:
2-23, Sakurajima 1-chome, Konohana-ku, Osaka 554, Japan
Phone:(81)6-465-3002
Facsimile:(81)6-465-4035
Telex: 63846 HZ SEK J

Ibaraki Works:
4, Omiyamachi Kogyo-danchi, Naka-gun, Ibaraki 319-21, Japan
Phone:(81)2955-3-5730
Facsimile:(81)2955-3-5733

OVERSEAS OFFICES AND SUBSIDIARIES:

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Telex: 8587231 HIZO D

Appendix I
Selected Asian Shipyards

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Facsimile:(86)1-501-4315
Telex: 210510 HZPK CN

Shanghai Office:
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Jakarta Office:
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Jakarta, 10110, Indonesia
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Facsimile:(62)21-3845927

Bangkok Office:
7th Floor, Harindhorn Tower, 54 North Sathorn Road,
Bangkok 10500, Thailand
Phone:(66)2-266-3162/3163
Facsimile:(66)2-266-3166

Taipei Office:
Room 902, Chia Hsin Building, 96 Sec. 2, Chung Shan N. Road,
Taipei 10449, Taiwan R.O.C
Phone:(886)2-568-2022/2023
Facsimile:(886)2-568-2030

Hitachi Zosen Singapore Limited:
15, Benoi Road, Singapore 2262, Singapore
Phone:(65)861 6622
Facsimile:(65)861 4393
Telex:21906/21213 HZSIN RS

Appendix I
Selected Asian Shipyards

Hitachi Zosen Company(HK) Ltd.:
Room 1009, Tak Shing House, 20 Des Voeux Road, Central, Hong Kong
Phone:(852) 524-6237/522-0597
Facsimile:(852)845-9039
Telex: 73648 HITAC HX

Hitachi Zosen Engineering Singapore (Pte.) Ltd.:
UOB Building, 325 Boon Lay Place,
Jurong, Singapore 2264, Singapore
Phone:(65) 264 1344
Facsimile:(65)265 1952
Telex: 21999 HITASEC RS

Hitachi Zosen Europe Ltd.:
London:
6th Floor, 38 Finsbury Square, London EC2A 1PX, U.K.
Phone:(44)71-628-3891
Facsimile:(44)71-638-1309
Telex: 887873/884009 HZ LON G

Gloucester:
Pavilion 2A, Olympus Business Park Quedgeley, Gloucester GL2 6NF, U.K.
Phone:(44)452-72-4647
Facsimile:(44)452-72-4648

Hitachi Zosen U.S.A. Ltd.:
New York:
150 East 52nd Street, 20th Floor, New York, NY 10022, U.S.A
Phone:(1)212-355-5650
Facsimile:(1)212-308-4937
Telex: 232036 HZNY UR

Chicago:
1699 Wall Street, Suite 425, Mt. Prospect, IL 60056, U.S.A.
Phone:(1)708-427-8353
Facsimile:(1)708-427-1856

Appendix I
Selected Asian Shipyards

Nippon Kokan Koji K.K.

NKK Corporation is one of Japan's leading heavy industrial companies. Founded in 1912 as Japan's first manufacturer of seamless pipes, NKK has expanded into steelmaking, shipbuilding, steel fabrication, construction, industrial machinery, and engineering.To take advantage of emerging opportunities fostered by the structural changes in Japan's economy, NKK has diversified in recent years.The Company's new fields of business include advanced materials, electronics, computer systems, and urban development.

Appendix I
Selected Asian Shipyards

Mitsui Engineering & Shipbuilding Co., Ltd.

Index of services in Mitsui Engineering & Shipbuilding Co., Ltd.:

Ship & Ocean Project Division
Steel Structure & Civil Engineering Division
Diesel Engine Division
Material Handling Machinery Division
Technoservice Division
Urban Systems Development Division
Projects Division
Environment & Energy Division
Plant Engineering & Construction Division
Environmental Systems Division
Nuclear Energy Systems Division
Energy Plant Division
Rotating Machinery & Cogeneration Division
Advanced Machines & Systems Division
Business Development Planning Department
HB Project Department
Public Utilities Business Department
Defense Systems Department
Overseas Project Department
Transportation Department
Kantoh Office (Health & Medical Equipment)

Ship & Ocean Project Division
tel:81-3-3544-3318

Sales Dept. 1 & 2 (tel: 81-3-3544-3397/3398)
Newbuilding merchant vessels of various kinds, passenger ships, and special work vessels

Ocean Project Dept. (tel: 81-3-3544-3062)
Offshore steel structures & equipment
Offshore oil production facilities
Drilling rigs
Work vessels

Appendix I
Selected Asian Shipyards

Ship Repair Dept. (tel: 81-3-3544-3418)
- Ship repairing, modification and conversion work
- Maintenance and repair engineering

Naval Ship Subdiv. (tel: 81-3-3544-3237/3390)
- Mono-hull ship (training ship, Observation ship, Work boat etc.)
- Semi-submerged catamaran ship for oceanographic surveillance
- Surface effect ship
- Destroyer
- Submarine rescue tender
- Oceanographic surveillance ship
- Tank landing ship
- Patrol vessel large with helicopter

Marine Dept. (tel: 81-3-3544-3462/3430)
- High-speed catamaran vessel
- Semi-submerged catamaran for passenger (SWATH)
- Hovercraft
- Hybrid-hydrofoil catamaran
- Various types of advanced craft
- Restaurant ship
- Cruising ship
- Semi-submerged underwater viewing boat
- Pleasure boats of all types
- Marine facilities
- Artificial canoeing stadium
- Diving pools
- Attractions and service facilities for marine leisure lands and theme parks

Offices, Works and Laboratories

Head Office
6-4, Tsukiji 5-chome, Chuo-ku, Tokyo 104, Japan
Phone: Direct Call to each section, 81-3-3544-3147 (P.R. Dept.)
Telex: J22821 MITZOSEN
Fax: 81-3-3544-3050

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Selected Asian Shipyards

Tamano Works
1-1, Tama 3-chome, Tamano, Okayama 706, Japan
Phone: Direct call to each section, Information: 81-863-23-2010
Telex: 5946-888 MESTAM J
Fax: 81-863-23-2006

Chiba Works
1, Yawatakaigandori, Ichihara, Chiba 290, Japan
Phone: Direct call to each section, Information: 81-436-41-1111
Telex: 3783-553 MESCHI J
Fax: 81-436-41-5527, 43-1002

Osaka Works
2-32, Shibatani 1-chome, Suminoe-ku, Osaka 559, Japan
Phone: 81-6-681-3111
Fax: 81-6-681-7860

Oita Works
3, Hiyoshibaru, Oita 870-03, Japan
Phone: 81-975-93-3111
Fax: 81-975-93-3304

Yura Dockyard
193-13, Ajiro, Yura-cho, Hidaka-gun, Wakayama 649-11, Japan
Phone: 81-738-65-1111
Telex: 5547-610 MESYUR J
Fax: 81-738-65-1125

Hokkaido Office
N2, W4, Chuo-ku, Sapporo 060, Japan
Phone: 81-11-261-0036
Fax: 81-11-231-5358

Tohoku Office
1-26, Ichibancho 3-chome, Aoba-ku, Sendai 980, Japan
Phone: 81-22-262-3481
Fax: 81-22-263-3430

Appendix I
Selected Asian Shipyards

Hokuriku Office
4-2, Higashiodori 1-chome, Niigata 950, Japan
Phone: 81-25-241-5958
Fax: 81-25-241-3354

Kantoh Office
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Phone: 81-3-3544-3460
Fax: 81-3-3544-3125

Chiba Branch Office
1, Yawatakaigandori, Ichihara, Chiba 290, Japan
Phone: 81-436-43-0914
Fax: 81-436-43-0374

Chubu Office
7-23, Meieki 4-chome, Nakamura-ku, Nagoya 450, Japan
Phone: 81-52-582-0145
Fax: 81-52-565-0171

Kansai Office
3-3, Nakanoshima 3-chome, Kita-ku, Osaka 530, Japan
Phone: 81-6-447-2001
Fax: 81-6-444-0820

Wakayama Branch Office
21-3, Higashinocho, Saikayamachi, Wakayama 640, Japan
Phone: 81-734-24-0031
Fax: 81-734-36-3961

Kobe Branch Office
3, Kaigandori, Chuo-ku, Kobe 650, Japan
Phone: 81-78-321-2501
Fax: 81-78-331-5062

Chugoku Office
7-10, Ohtemachi 2-chome, Naka-ku, Hiroshima 730, Japan
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Fax: 81-82-247-0474

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Selected Asian Shipyards

Tokuyama Branch Office
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Fax: 81-834-21-1166

Kure Branch Office
3-32, Teramotocho, Kure 737, Japan
Phone: 81-823-25-6736
Fax: 81-823-25-6738

Okayama Office
8-29, Saiwaicho, Okayama 700, Japan
Phone: 81-86-233-4131
Fax: 81-86-225-4570

Shikoku Office
1, Kameicho 5-chome, Takamatsu 760, Japan
Phone: 81-878-33-4111
Fax: 81-878-31-2762

Matsuyama Branch Office
3-8, Nibancho 3-chome, Matsuyama 790, Japan
Phone: 81-899-47-7060
Fax: 81-899-47-7560

Kyushu Office
1-1, Hakataekimae 1-chome, Hakata-ku, Fukuoka 812, Japan
Phone: 81-92-411-8111
Fax: 81-92-471-0468

East Kyushu Office
9-24, Chuo-cho 2-chome, Oita 870, Japan
Phone: 81-975-37-9260
Fax: 81-975-38-2904

Tamano Laboratory
16-1, Tamahara 3-chome, Tamano, Okayama 706, Japan
Phone: 81-863-31 -9611
Fax: 81-863-31 -4046

Appendix I
Selected Asian Shipyards

Chiba Laboratory
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Phone: Direct call to each section, Information: 81-436-41-1111
Fax: 81-436-43-1785

Akishima Laboratory
1-50, Tsutsujigaoka 1-chome, Akishima, Tokyo 196, Japan
Phone: 81-425-45-3111
Fax: 81-425-46-3570

Tsukuba Research Center
1-6, Sengen 2-chome, Tsukuba, Ibaraki 305, Japan
Phone: 81-298-58-6155
Fax: 81-298-58-6156

Singapore Representative Office
Room 4102, 16 Raffles Quay, Hong Leong Building, Singapore 0104
Phone: 65-220-4065
Telex: 24102 MESPORE
Fax: 65-225-9643

Beijing Representative Office
Room 407, The Beijing Fortune Building, 5 Dong San Huan Bei-lu, Chao Yang District, Beijing, 100004, China
Phone: 86-1-501-3188/9
Fax: 86-1-501-3130

Jakarta Representative Office
7th Floor, Nusantara Building, JL. M.H. Thamrin No.59 Jakarta, Indonesia
Phone: 62-21-336644
Telex: 61-462 MESIA
Fax: 62-21-336166

Mitsui Zosen (U.S.A.) Inc.
Suite 501, 405 Park Avenue, New York, N.Y. 10022, U.S.A.
Phone: 1-212-308-3350/4
Telex: 232671 MES UR
Fax: 1-212-308-3358

Appendix I
Selected Asian Shipyards

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Telex: 885971 MESLDN G
Fax: 44-71-726-4359

Mitsui Zosen Enterprise (H.K.) Ltd.
Room 2317, Jardine house, 1 Connaught Place, Central, Hong Kong
Phone: 852-5264291/3
Telex: 73916 MZEHK HX
Fax: 852-28106117

Appendix I
Selected Asian Shipyards

Singapore

RayControl Service Pte Ltd.
Singapore Technologies
ST SE Shipbuilding & Engineering

ST's marine arm specializes in various engineering works for both military and commercial craft, from design to building, reconstruction to modernization, ship repair, and fabrication of military engineering equipment, to other technical management services. ST's modern shipyard facilities include two floating docks, and in-house design teams apply the latest CAD/CAM design technologies for advanced designs and construction methods. Today, ST has diversified into land-based engineering as well, providing turnkey solutions in transport infrastructure and public works.

SHIPBUILDING & ENGINEERING: Project manager, designer, builder, and repairer in the marine and related industries; the first shipyard outside Western Europe to be certified to ISO 9001.

ST's MISSION: Singapore Technologies Shipbuilding & Engineering aims to be an internationally competitive and first class project manager, designer, builder, and repairer in the marine and related industries.

Singapore Technologies Shipbuilding & Engineering (ST SE) is the marine sector of Singapore Technologies. Initially set up to provide a local capability in the construction of naval patrol craft, ST SE has since diversified to related business areas in commercial shipbuilding, ship repair of small- to medium-sized vessels, and land-based engineering. ST SE specializes in the design, building, refurbishing, reconstruction, and modernization of a wide range of military and commercial vessels, as well as the fabrication of military engineering equipment and the provision of technical management services.

SHIPBUILDING: ST SE is a specialist in the design and construction of a wide range of military and commercial vessels.

NAVAL AND PARA-MILITARY VESSELS: ST SE's naval shipbuilding dates back to its inception in 1968, when it constructed four 45-meter Missile Gun Boats (MGBs) locally for the Republic of Singapore Navy.

Appendix I
Selected Asian Shipyards

ST SE's naval and paramilitary shipbuilding services are provided on a total turnkey basis - from concept definition to detail design, construction, installation, and integration of weapon systems, to testing and commissioning. Their track record includes sophisticated naval and paramilitary craft built and delivered to the region's coast guards and navies in Thailand, Brunei, India, and Kuwait.

The successful completion of ST SE's Missile Corvette Vessel (MCV) program and outfitting of three Mine Counter Measure Vessels (MCMVs) for the RSN has demonstrated that ST SE's standard is equal to that of international projects involving the use of sophisticated technology.

COMMERCIAL VESSELS: To date, ST SE has delivered more than twenty feeder container vessels to customers in Europe, USA and Asia. ST SE is currently the leading builder of container vessels in the region.

Other vessels which have been delivered include:

LPG Tankers
RO-RO Vessels
High Speed Passenger Ferries
Offshore Supply Vessels

SHIP REPAIR: ST SE is capable of undertaking extensive ship repair work, which includes jumbosizing, ship conversion, refurbishment, modernization, retrofitting, rebuilding, and upgrading of a wide range of military and commercial vessels.

FACILITIES AND CAPABILITIES: ST SE's two specialized and modern shipyards at Benoi and Tuas are state-of-the-art facilities.

The Benoi yard's comprehensive facilities include two new building berths for vessels of up to 12,000 DWT, five large all-weather covered construction halls, and state-of-the-art underwater plasma-cutting and CNC pipe-bending machines.

The newer Tuas yard has two floating docks - one with a 17,000-ton lifting capacity that can dock vessels up to 40,000 DWT, and a second which can dock Panamax-sized vessels of up to 70,000 DWT. Its two building berths are capable of building ships up to 30,000 DWT and have fully equipped hull fabrication and outfitting workshops.

Appendix I
Selected Asian Shipyards

ST SE maintains a standard in engineering expertise, including the latest in CAD/CAM facilities. Their CAD system is one of the most advanced in ship design in use today.

ENGINEERING FABRICATION: ST SE is a leader in the fabrication of military engineering equipment, with its comprehensive resources and experience in the handling of aluminum and steel structures.

ST SE designs, manufactures, refurbishes, modifies, and upgrades a wide range of military equipment, including the Floating Bridge System, Modular Pontoons, Portable Mats, Portable Assault Craft, Light Assault Bridges, and Ferry Bridges.

LAND-BASED ENGINEERING: ST SE has expanded the scope of its engineering expertise to include land-based engineering work. ST SE now supplies products and provide integrated solutions to infrastructural projects in transportation, environment, and other services.

QUALITY SERVICE STATEMENT: All activities and work processes that affect the quality of our products and services are managed effectively so as to meet customers' requirements on time, the first time, every time.

OFFICES:

Main office & main yard:
Singapore Technologies Shipbuilding & Engineering Ltd
7 Benoi Road
Singapore 2262
Tel: 861 2244
Fax: 861 3028

Tuas yard:
60 Tuas Road
Singapore 2263
Tel: 862 2902/3
Fax: 862 5382

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Selected Asian Shipyards

Overseas office:

PT SSE-Van Der Horst Indonesia
Jalan Raya Serang Km 8.5
Kawasan Industri Manis I
Jalan Manis II, 34 Tangerang
15136 Jawa Berat, Indonesia
Tel: (62-21) 591 8726/9
Fax: (62-21) 591 8726

Appendix I
Selected Asian Shipyards

Sembawang Shipyard

SEMBAWANG Shipyard was set up in December 1968. Today, Sembawang Shipyard has a regional reputation for quality and superior customer service in ship repair and conversion as well as shipbuilding. The shipyard offers the largest ship repair facility in a single location in the Singapore region.

Sembawang's dedicated shipbuilding arm is known internationally as a quality builder of specialized tonnage. They have expanded into related activities such as corrosion control, heating, ventilation, air-conditioning, fire protection systems and more recently in furnishing, panelling and interior designs. Sembawang Shipyard is actively pursuing a policy of regionalization with the development of a shipyard in Indonesia's Karimun Island as a start.

Appendix I
Selected Asian Shipyards

Korea

DAEWOO

Shipbuilding Division at Okpo Shipyard

The Shipbuilding Division at Okpo Shipyard maintains about 530 designers from the level of initial function design to detail production design. In addition, Daewoo has a number of inspectors with approximately 560 units of measuring equipment for quality control to the higher standard.

By the end of 1991, Okpo Shipyard delivered 144 vessels totalling 11 Mil. DWT, including 46 crude oil tankers, 52 bulk carriers, 25 containerships and 21 other types of vessels.

These accomplishments include:

Crude Oil Tankers
Chemical Tankers & Product Carriers
Bulk Carriers
OBO Carriers
Containerships
Roll-on/Roll-off Ships
LNG Carriers
Specialty Vessels
Repair and Conversion

The Okpo Yard is located at Okpo Bay on Koje Island off Korea's south coast. Proximate to the leading port of Pusan, Koje is Korea's second largest island. The yard is one of the world's newest multi-dimensional and multi-purpose yard, offering modern, streamlined, sophisticated production equipment and facilities.

Appendix I
Selected Asian Shipyards

Hyundai

Hyundai Heavy Industries(HHI) Co., Ltd. held the dedication ceremony for the Ulsan shipyard in 1974. On this momentous occasion, the christening of the first supertanker was also celebrated. Being the first in the world to celebrate a dedication and a christening simultaneously, HHI attracted considerable attention in the world maritime circles.

As a versatile and flexible shipbuilder, HHI has grown to become one of the most competitive and advanced producers of all types of vessels including conventional bulk carries, crude/product oil tankers, highly sophisticated probe carriers, chemical tankers, ro-ro ships and gas carriers. The Moss-type LNG carrier, the most advanced and safe form of overseas LNG transport, is the result of HHI's focused research activities. The shipbuilding division has successfully delivered over 630 vessels.

HHI established the engine & machinery division in 1978 to localize the production of parts. HHI's line of marine and stationary diesel engines have earned widespread recognition both at home and abroad. In order to further diversify its production, HHI has expanded into industrial machinery and machine tools manufacturing.

The industrial plant division has also been successful in diversification and expansion. Mainly concerned with R&D in basic engineering and technology, HHI manufactures and offers a full line of services for industrial equipment and plants. With its ability to implement innovative solutions to complex engineering tasks, HHI's services include power generation, environmental plant, iron & steel plant, cement plant, industrial machinery & equipment, and construction plant.

In 1976, the Offshore & Engineering Division began accumulating experience and know-how gaining recognition in the international market. Today, HHI provides full services in engineering, procurement, fabrication, transportation, installation, hook-up and commissioning for a variety of offshore platforms, HHI produced and delivered two of the world's largest jackets from Korea to USA for Exxon. Other HHI international clients include ONGC, ARAMCO, UNION, WOODSIDE, BP, HMDC and many more.

The scope of manufacturing was broadened when Hyundai Steel Tower Industries Co., Ltd., already in operation since 1973, joined Hyundai Heavy Industries Co., Ltd., in 1993. Now it is also capable of producing extra high voltage steel towers and poles.

The Hyundai Robot Industry Co.,Ltd. was also merged with HHI in 1993, providing clients with sophisticated robot systems for welding, handling, painting, assembling etc.

Appendix I
Selected Asian Shipyards

HHI provides international clients with the cost-effective and technologically advanced solutions.

Construction Equipment Division expanded manufacturing facilities in Ulsan and increased activities in technological development to enhance its position in the international market.

HHI offers a comprehensive line of construction equipment including hydraulic excavators, crawler dozers, crawler loaders, wheel loaders, skid steer loaders and folklift trucks.

HHI's Engineering Division, a manufacturer of power and distribution transformers Hyundai Electrical Engineering Co.,Ltd., merged with HHI in 1993, specialized in manufacturing heavy electrical products. Technological exchanges with industry leaders and self-developed technologies have groomed Electrical Engineering Division of HHI into an international corporation.

HHI's switch gears and rotating machinery play pivotal roles in power plants, industrial plants, large public facilities, and even railway vehicles and systems. High voltage rotating machines with VPI and HPM insulation system and Nomex for low voltage systems are very low in noise levels.

Electrical Engineering Division also manufactures advanced electricity converting parts with semiconductors assuming pivotal roles. Its power and distribution transformers are also some of the largest in the world, at 525 kV/700 mva.

The Hyundai Mipo Dockyard Co., Ltd. (HMD), a sister company of Hyundai Heavy Industries Co., Ltd. was created in 1975. Having access to the world's largest ship repair complex, HMD has completed over 4,500 repair and conversion projects over the years.

From its establishment, HMD was quick to adapt to changes in the shipbuilding industry and implement strategies flexibly. The sheer size of the four drydocks and 3 km of repair piers facilitate work on any type of vessel effectively and efficiently. Moreover, highly qualified workers skillfully handle some of the most sophisticated equipment in the shipbuilding industry today.

GP
ASSOCIATES, INC.
Engineers/Architects

Appendix J

Abbreviations and Acronyms

Appendix J
Abbreviations and Acronyms

ac	acre(s)
ADB	Asian Development Bank
AE	Auxiliary Explosive [Ships]
AFB	Air Force Base
AFS	Auxiliary Fleet Supply [Ships]
APEC	Asian Pacific Economic Cooperation
APL	American President Lines
ASEAN	Association of Southeast Asian Nations
BASOPS	Base Operations
bbl	barrel
BOD	Biochemical Oxygen Demand
BOS	Base Operations Support (Contract)
BRAC	Base Realignment and Closure
BRACC	Base Realignment and Closure Commission
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CINCPAC	Commander in Chief, Pacific
CINCPACFLT	Commander in Chief, Pacific Fleet
CNMI	Commonwealth of the Northern Mariana Islands
CNO	Chief of Naval Operations
COMNAVMAR	Commander, Naval Forces, Marianas
DL	Direct Labor
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
DWT	Deadweight ton
ea	each
EAEC	East Asia Economic Caucus
EBS	Environmental Baseline Survey
EEZ	Exclusive Economic Zone
EFTA	European Free Trade Area
EIS	Environmental Impact Statement

Appendix J
Abbreviations and Acronyms

EOD	Explosive Ordnance Disposal
ESCAP	Economic and Social Commission for Asia and the Pacific
ESQD	Explosive Safety Quantity Distance
EU	European Union
FISC	Fleet Industrial Supply Center
FMC	Federal Maritime Commission
FMS	Foreign Military Sales
FONSI	Findings of No Significant Impact
FOSL	Findings of Suitability for Lease
FSM	Federated States of Micronesia
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEDA	Guam Economic Development Authority
GLUP	Guam Land Use Plan
GNP	Gross National Product
GovGuam	Government of Guam
GPA	Guam Power Authority
gpd	gallons per day
gpm	gallons per minute
GWA	Guam Waterworks Authority (formerly PUAG)
HAZMAT	Hazardous Materials
HAZMIN	Hazardous Materials Minimization Program
HHG	Household Goods
HTSUS	Harmonized Tariff Schedule of the United States
IMF	International Moentary Fund
ISTEA	Intermodal Surface Transportation Efficiency Act
JOAP	Joint Oil Analysis Program
kva	kilovolt-amperes
LCAC	Landing Craft, Air Cushion
lf	linear feet
LNG	Liquid Natural Gas
LPG	Liquid Propane Gas

Appendix J
Abbreviations and Acronyms

LRA	Local Reuse Authority
ls	lump sum
MCON	Military Construction [Project]
mgd	million gallons per day
MD	manday(s)
MH	manhour(s)
MHE	Material Handling Equipment
MLLW	Mean Lower Low Water
MMT	Million Metric Tons
MPS	Maritime Prepositioned Ships
MSC	Military Sealift Command
MSRA	Master Ship Repair Agreement
MTA	Midterm Availability
NAFTA	North American Free Trade Agreement
NAVACTS	Naval Activities
NAVMAG	Naval Magazine
NAVSEA	Naval Sea Systems Command
NCTAMS	U.S. Naval Telecommunications Area Master Station
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NIE	Newly Industrializing Economies
NISE	Naval in Service Engineering
NMCB	Naval Mobile Construction Battalion (SeaBees)
NSD	Naval Supply Depot
NSWU	Naval Special Warfare Unit (SEALS)
OEA	Office of Economic Adjustment
OPEC	Organization of Petroleum Exporting Countries
OSHA	Occupational Safety and Health Agency
PACDIV	Pacific Division, Naval Facilities Engineering Command
PACFLT	U.S. Pacific Fleet
PACTAD	Pacific Trade and Development Conference
PAG	Port Authority of Guam
PBEC	Pacific Basin Economic Council
PCB	Polychlorinated Biphenyls
PECC	Pacific Economic Cooperation Conference

Appendix J
Abbreviations and Acronyms

PIAFA	Pacific Insular Area Fishery Agreements
PIANC	Permanent International Association of Navigation Congress
PNG	Papua New Guinea
POL	Petroleum, Oil, and Lubricants
POV	Privately Owned Vehicles
PUAG	Public Utility Agency of Guam (now, GWA)
PWC	Public Works Center
RFP	Request for Proposals
RIF	Reduction in Force
RMI	Republic of the Marshall Islands
ROH	Regular Overhaul
Ro-Ro	Roll on - Roll off
rt	round trip
SEALS	common name for NSWU (Naval Special Warfare Unit)
SeaBees	common name for NMCB (Naval Mobile Construction Battalion)
sf	square foot
sq	square
SRF	Ship Repair Facility
TEU	Twenty-Foot Equivalent
TSDF	Treatment, Storage, Disposal Facilities
TTPI	Trust Territory of the Pacific Islands
USACE	U.S. Army Corps of Engineers
USAR	U.S. Army Reserve
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
UTS	Utility Technical Study
VLC	Very Large Carriers
VR	Voyage Repairs
WTO	World Trade Organization
WWTP	Wastewater Treatment Plant

GP
ASSOCIATES, INC.
Engineers/Architects

Appendix K

References

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References

3rd Korean Visitor Exit Survey, Final Report. Market Research & Development, Inc., Agana, Guam: Guam Visitors Bureau, March 1995.

Aiavao, Ulafala. "Fishing for more Money: Divided the Islands will Fall." Island Business Pacific, September 1994, p. 22.

Asia-Pacific Economic Update. By Dr. Lee H. Endress and Mark G. Harstad. Honolulu: United States Pacific Command, 1995.

Bartram, Paul K.; Bourland, Joe; Gates, Paul D.; Kaneko, Dr. J. John; and Seth, Oliver. Study of the Longline Fishery in Guam: Assessment of the Market and Economic Impacts. Tamuning: Department of Commerce, 1991.

Carter, Ray. Casamar Guam, Agana, Guam. Interview, 18 July 1996.

"China's Growth will Strain Global Supplies, Analyst Says." The Honolulu Advertiser, 29 August 1996.

Department of Commerce, Territory of Guam. 1993 Summary Tuna Transshipment Activity on Guam. Tamuning: Department of Commerce, 1994.

Department of Commerce, Territory of Guam. 1994 Annual Economic Report of Guam. Tamuning: Department of Commerce, 1995.

Department of Commerce, Territory of Guam. 1995 Annual Economic Report of Guam (Draft Extract). Tamuning: Department of Commerce, 1996.

Department of Commerce, Territory of Guam. Guam Large Scale Fisheries Economic Profile for 1995. Tamuning: Department of Commerce, 1996.

Department of Commerce, Territory of Guam. Monthly Report on Tuna Transshipped from Guam by Species, from 01/94 through 12/94. Tamuning: Department of Commerce, 1995.

Appendix K
References

Department of Commerce, Territory of Guam. Monthly Report on Tuna Transshipped from Guam by Species, from 01/95 through 7/95. Tamuning: Department of Commerce, 1995.

Edwards, Chris. "Current Economic Trends in Asia and the Pacific." Far East and Australia, London: Europa Publications, 1995.

Engineering Concepts, Inc., Utility Technical Study for Potable Water and Sanitary Sewer Systems, Volume 1, Apra Habor Naval Base and Naval Magazine, Honolulu, HI: Dept of the Navy, 1994.

"Expert Champions Pacific at Tuna Conference." Pacific Daily News, 27 October 1995.

Forbes, Dean. "Toward the 'Pacific Century': Integration and Disintegration in the Pacific Basin." Far East and Australia, London: Europa Publications, 1995.

Gaffney, Rick and Associates. Guam Charter Boat Feasibility Study, Tamuning: Department of Commerce, 1991.

"Guam Cashing in on Global Trend of Retail Tourism." The Honolulu Star-Bulletin, 23 August 1996.

Guam Economic Review, 3rd Quarter Calendar Year 1994, July-September 1994. Agana, Guam: Department of Commerce, 1994.

Guam Economic Review, Quarterly Report October-December 1994. Agana, Guam: Department of Commerce, 1994.

Guam Economic Review, Quarterly Report January-March 1995. Agana, Guam: Department of Commerce, 1995.

Guam Economic Review, Quarterly Report April-June 1995. Agana, Guam: Department of Commerce, 1995.

Hahn, Robert. Maritime Agencies of the Pacific, Ltd., Tamuning, Guam. Interview, June 1996.

Appendix K
References

Hamnett, Michael P., and Printz, William Sam. The Contribution of Tuna Fishing and Transshipment to the Economies of American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam. Honolulu: Joint Institute for Marine and Atmospheric Research, 1996.

Japanese Visitors to Guam, Quarterly Exit Survey. Tom Iverson & Associates, Agana, Guam: Guam Visitors Bureau, October 1995.

Jarobilla, Mel. Atkins Kroll, Tamuning, Guam. Interview, 12 June 1996.

Miller, Andrew J. Ambyth Shipping, Tamuning, Guam. Interview, 12 June 1996.

Osman, Wali M. Commonwealth of the Northern Mariana Islands Economic Report Autumn 1995. Honolulu: Bank of Hawaii, 1995.

Osman, Wali M. Federated States of Micronesia Economic Report Autumn 1995. Honolulu: Bank of Hawaii, 1995.

Osman, Wali M. Guam Economic Report Summer 1995. Honolulu: Bank of Hawaii, 1995.

Osman, Wali M., and Ramsour, David L. An Economic Assessment of the Republic of Palau. Honolulu: Bank of Hawaii 1994.

A Report on the State of the Islands. Prepared by the Office of Territorial and International Affairs. Washington, DC: U.S. Department of the Interior, 1994.

Silverman, Gary. "Sea Sick, Shippers Cut Rates in Price War." Far Eastern Economic Review, April 11, 1996, p. 76.

Stillwell, Roger. Investment Opportunities in United States Insular Areas and Freely Associated States. Washington, DC: U.S. Department of the Interior.

Taiwanese Visitors to Guam, Exit Survey. Tanner Montvel-Cohen & Yee, Agana, Guam: Guam Visitors Bureau, August 1994.

Thompson, William R. Atkins Kroll, Tamuning, Guam. Interview, April 1996.

"Tourism in the Pacific Islands: Part 2?" Pacific Magazine, September/October 1995, pp. 43-46.

Appendix K
References

"Tourism in the Pacific Islands: Where is it Now? Where is it Going?" Pacific Magazine, July/August 1995, pp. 36-37.

"Transport: Shipping." Asia 1992 Yearbook, Far Eastern Economic Review, 1993.

"Unity will be Vital for Pacific Fishing." Island Business Pacific, September 1994, p. 13.

"We Can Host a $4 Billion Fishing Industry." Pacific Daily News, 12 July 1996.

Wen, Donald. Tamuning, Guam. Interview, 12 August 1996.

Williams, Kevin. Guam Fresh Tuna Longline Transshipment Study Phase I Fishery Description. Australia: W.W. Fisheries Consultants, 1989.

Wilson, Peter. Global Ocean Consultants, Wailuku, Maui, Hawaii. Interview, 25 July 1996.

Wilson, Peter. "Pacific Tuna: Boom or Bust." Island Business Pacific, July 1995, p. 40.

Transportation and Transshipment Presentation
By
Senator Joe T. San Agustin, Chairman
Transportation and Transshipment Task Force
Vision 2001 Committee

Thank you Governor...

I appreciate the opportunity to present the VISION... and strategic
#1 objectives of the Transportation and Transshipment Industry on behalf of our task force... I would like to first extend my appreciation to the members of the Transportation and Transshipment Task Force... namely, Van Shelley, Co-chair, Tom Ahillen, Jess Iwashita, David Tydingco, Ray Carter, Eloy Bermudes and Senator John Aguon for their fine work and contribution towards this effort.

Our Island's history has been influenced by years of military
#2 presence... However... with the closures and realignment efforts of military installations... such as NAS Agana... the Ship Repair Facility... Fleet and Industrial Supply Center and other facilities... within Naval activities, Guam has a global wide window of opportunity... to become a vibrant and growing center of economic development... in both air and seaport activities in the Asia Pacific region.

Guam's economy, as a result of tourism, is interdependent on the
#3 economies of our Asian neighbor countries. We look to the United States for our political determination... but we must and continue to look to our Asian Pacific neighbors for our economic survival.

Guam's position in the Asia Pacific rim... is a crucial link between east and west. Our government's leadership continues to focus... on economic diversification and growth... in order to provide a sound and competitive economy...this is why... we are all here this morning...to provide for a promising future for the people of Guam and generations to come.

The vision statement for the Transportation and Transshipment industry is "to contribute to the advancement of the local and regional community... by providing the opportunity... for the development... expansion... and improvement of the transportation and transshipment industries... resulting in a more stable... robust and competitive economy."

We envision a growing and dynamic enterprise... and achieving a preeminent position... as the major shipping and aircargo center... in this region of the world. To achieve this objective... Guam must adequately plan... for the most effective use of former military facilities...for local government and civilian purposes. This is an opportunity... to diversify... and widen our economic base.

These military installations... offer us a wealth of opportunity... for economic development. These opportunities are:

(1) Guam must secure... from the federal government the designation of a U.S. Customs pre-clearance area for passengers and cargo bound for the United States.

This in itself...has the potential...of creating...and establishing...a viable bonded warehousing industry.

(2) The designation of the Guam Economic Development Authority as a Local Redevelopment Authority... that will oversee the transfer of military properties... under the BRAC recommendations for economic development purposes.

(3) Establishment of assembly warehousing capabilities... wherein parts and supplies would be shipped to Guam... for assembly... manufacturing... packaging... and handling.

(4) The closure of the Naval ship repair facility... provides... an opportunity for local government and private sector partnership... in the area of industrial repair work... similar to the "dual-use" concept... that allows private companies to use existing... underutilized... but fully functional military facilities... equipment... and machinery. This will not only allow a business to save money... but also... will provide a means for it to make money and create jobs.

(5) Our Government can provide special economic incentives... and resources such as job tax credits... streamlined approval of licensing... and permits... in order to attract businesses to utilize facilities... within the closed military properties... resulting... in the continued viability of our local economy.

(6) A strong and cooperative partnership... with the private sector can provide... for an expanded and improved infrastructure capabilities... at both the seaport... and airport facilities...

(7) The reuse of NAS Agana would place Guam... at the forefront for aviation related activities... with the establishment of a flight instruction school... aircraft maintenance center... air traffic maintenance and supply center as well as expanded facilities for express mail... bulk and redistribution products... package... and parcel handling.

(8) Our greatest natural resources... is... the inner Apra Harbor's deep water seaport and facilities. A new... Apra Harbor... can be developed... to expand transshipment... industrial repair work... fish processing capabilities... passenger cruise facilities... and light manufacturing uses.

(9) A privatized Ship Repair Facility... will be able to continue... to support Navy missions... but will also... be able to expand... and provide needed repair... and overhaul services... to Guam's growing maritime industries... including... an expanding fishing fleet and emergent repairs... for the container vessels and passenger ships.

(10) We have the potential... for Guam... to grow as a container staging center for U.S. and Asian container traffic. Many of the container ships... plying the Pacific rim... are too small to be efficient trans-pacific carriers. There is a niche... to fill... that will allow Asian container ships... to shuttle between the Pacific Rim destinations and Guam. While on Guam... those cargoes will first be consolidated or containerized... then pre-cleared through U.S. Customs... stored in bonded warehouses... and loaded on larger U.S. and foreign flag carriers... Naturally... the facilities on Guam will allow the reverse process as well.

(11) There is also a significant demand... for service within the growing fishing fleet in the waters around Guam... We envision... approximately 1,000 landings per year... from a fleet of about 150 purse seiners and longliners. Access to the piers within Apra Harbor... will enhance significantly... the level of services provided... to this segment of the transshipment industry.

Although, everyone realizes that the closures of these military installations...would have a significant adverse impact on our local economy... there is... however... a golden opportunity... to build a new future for Guam... upon the foundations of change... which are occuring now.

Despite the significance of these impacts to our local economy... it is clear and evident... that Guam has made... and will continue...to make a successful transition... from a military economy...to a private sector driven economy. There is no doubt... that SRF and FISC brought improvements to our social and economic communities... by providing employment... and career opportunities... to our island workforce. Many of our citizens have not only found their occupational niche... while working at these facilities... but for years... have entrusted the federal government for job security... But those employees... do not have to lose job security entirely... It means... that the Government of Guam must act **expeditiously**... be **aggressive...** and **innovative...**in working with the military... and the private sector... in successfully converting these facilities to joint public and private usage... in order to maintain the valuable pool... of skilled workers.

The Office of Economic Adjustment of the Department of Defense... recently released a December 1994 survey.. of base recovery projects from 1961 to 1993... that shows 83 bases have industrial parks... 43 bases have air and seaport facilities... 57 bases have educational centers... and 54 bases have developed warehousing and transshipment centers... More importantly... during the base closures in the 1960's and 1970's... there were 5,368 civilian jobs loss from five military bases... However... approximately 20,556 new private sector jobs... have been created... from these same five bases closed.

In the base closures of the 1990's... the civilian job losses for five bases in 1991 and 1993... totaled 2,851. However... new jobs created...were 5,101 for these same five military facilities. Job creation continues... to grow at former military installations... now operated by both public and private ventures.

Although, Guam is unique and isolated... we too have an opportunity...to emulate these same successes... in creating new jobs. Under the BRAC'95 Recommendations... Guam stands to lose approximately 4,187 direct and indirect civilian jobs... between now and 1999. However... given the areas of opportunities... that I have just outlined... it is conceivable and highly attainable... for us to gain... and have the potential of retaining... and creating... twice as many new jobs... within the transportation and transshipment industries alone.

The people of Guam have demonstrated... the ability over the years to attract new investment opportunities... including the creation of new industries designed to create jobs... and provide for a sound economic base for our territory.

Just as many... of America's most successful companies rely on strategic business plans to guide their growth, so too must Guam begin to think... and act like entrepreneurs... in the redevelopment of these available facilities... for the Island's transportation and transshipment needs.

Guam must think competitively...utilizing all possible tools... at its disposal... to maximize the value of its strategic location... as an established link for businesses... between Asia and the U.S.

Guam is acting cooperatively... in the interest of developing itself... as a mature... and aggressive player... in the Asia Pacific region. We offer today... a partnership... and an opportunity... to expand together... and to cultivate... the much needed awareness... of the economic potential... in the transportation and transshipment industries... We must be up to the challenge... and eagerly excited... to get to work. This is our **VISION...** and **CHALLENGE...**let us embrace it... as a **real opportunity**...not fear it!

Thank you.