



**TUMON BAY MASTER PLAN**

**DEPARTMENT OF COMMERCE  
GOVERNMENT OF GUAM**

**Prepared by  
DUENAS & SWAVELY, INCORPORATED  
in association with  
TANIGUICHI-RUTH, AIA & ASSOCIATES  
1984**







GOVERNMENT OF GUAM  
AGANA, GUAM 96910

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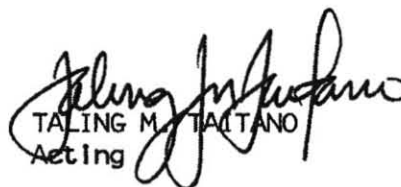
Memorandum

To: Director, Bureau of Planning  
Attn: Chief Planner  
From: Director, Department of Commerce  
Subject: Tumon Bay Master Plan

I have attached herewith the two (2) technical reference copies of the Tumon Bay Master Plan designated for your agency. These are the final printed versions of the Tumon Bay Master Plan.

The printed copies of Appendix B (Rules and Regulations for Development of Tumon Bay) and Appendix C (Environmental Design Guidelines for Development of Tumon Bay) as well as the printed copies of the Executive Summary which will be abbreviated version of the "plan" aspects of the Master Plan, along with scaled down copies of the more important maps, have not yet been submitted to us by the Plan's Consultant. These will be forwarded accordingly when they are received.

Your acknowledgement receipt for these documents will be greatly appreciated.

  
TALING M. TAITANO  
Acting

Attachment



## **Tumon Bay Master Plan [Nineteen Maps]**

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## PART ONE THE SETTING

This first Part of the Master Plan presents the basic facts and figures about Tumon Bay. Its four chapters are:

- Chapter I History of Tumon Bay
- Chapter II Description of the Project Area and Summary of Facilities and Resources
- Chapter III Demographic and Economic Data
- Chapter IV Visitor Arrivals and Accommodations

The intent of this Part is to familiarize the reader with Tumon Bay as it now exists and to provide certain maps, charts and tables of Tumon Bay data for later reference by the Master Plan.

### CHAPTER I HISTORY OF TUMON BAY

Tumon Bay was meant for leisure activities. Its tranquil, reef-protected bay and palm treelined beachfront provide the perfect environment for rest and recreation. Following World War II, the U. S. military took advantage of Tumon Bay's natural resources by establishing an Officers' Club near the site of the present Dai Ichi Annex Hotel. Local residents, too, have long availed themselves of the area's beauty by using Tumon as a favorite park and picnic site. This image of an idyllic, tropical setting probably contributed more to the eventual development of Tumon Bay as a tourist destination than did any other factor. And now, when talking of Guam's tourism industry, one talks primarily of Tumon Bay.

The emerging potential for tourism on Guam resulted from a combination of factors. Rescinding the security clearances in 1962 for entry into and exit out of Guam provided less restricted access for visitors. Then the initiation of air service between Tokyo and Guam in 1967 by Pan American Airways established a transportation link to a large, potential market. Concurrent relaxing of travel and foreign exchange restrictions by Japan allowed its citizens to venture abroad. And finally, the tireless efforts of local businessmen, the Guam Visitors Bureau and Government of Guam agencies enhanced the marketability of Guam as an international tourist destination.

With these ingredients for a profitable tourism industry, investors were soon building facilities in Tumon Bay. During the late 1960's, the Guam Tokyu Hotel (now the Pacific Islands Club) and the Fujita Tumon Beach Hotel were built. In 1970, the Guam Continental Hotel (now the Pacific Islands Hotel and Beach Colony) opened its doors. Following closely was increased airline service from Japan, the U. S. West Coast and points in the Far East by Pan American Airways, Japan Air Lines, and Continental Air Micronesia.

The increases in visitor arrivals and the slow but sure development of a reliable tourist plant lent more emphasis to marketing efforts. The Guam Tourist Commission was reorganized into the Guam Visitors Bureau (GVB) to provide a vehicle for coordinated marketing efforts of the industry and the public sector. As these efforts influenced the annual number of visitors to Guam, so grew the economic importance of tourism.

Soon afterwards, the need for more tourist accommodations became apparent. During the early and mid-1970's a second period of hotel construction took place. The Guam Dai-Ichi opened in 1971, the Guam Hilton Hotel and the Guam Hotel Okura began business in 1972, the Guam Kakuei Hotel (presently the Dai-Ichi Annex) opened its doors in 1973 and, finally, the Guam Reef Hotel began its operations in 1974. The increased available accommodations and the intensified marketing efforts soon placed Guam as a major tourist destination in the Pacific.

The construction level and growth in Tumon Bay during the period from 1975-1980 reflected the world's problems. Escalating costs of fuel prompted cutbacks in the travel plans of many people. Remarkably, Guam suffered far less than most other tourist destinations. Later, as international forces slowly responded to the new economics of OPEC, Guam lured more and more visitors to Tumon Bay. At the end of the 1970's, Guam was enjoying its highest visitor arrivals ever, attracting more than 300,000 in 1980.

## CHAPTER II

### DESCRIPTION OF THE PROJECT AREA, POPULATION, AND INVENTORY OF PUBLIC AND PRIVATE FACILITIES

This Chapter presents a description of the Tumon Bay Project area as well as a description of the existing public and private facilities.

#### A. PROJECT AREA

This Master Plan pertains to the Tumon Bay area confined by the Tumon Lagoon reef line to the west, the cliffline between Dos Puntan Amantes and the Australian Cable Station to the north, Marine Drive between its intersections with San Vitores Road and Tumon Road to the east, and the cliffline between JFK High School and the former Guam Memorial Hospital to the south. The project area is depicted on Plate II - 1. This area encompasses 645.5 acres.

#### B. POPULATION

Two categories of population are associated with Tumon Bay: residents and tourists.

##### 1) Residents

A census breakdown of Tumon Bay is not available and, as one of many villages in the Municipality of Tamuning, an accurate census is impossible to extrapolate from the overall municipal data. However, the resident population can be estimated as a function of the number of dwelling units in Tumon Bay.

Based on single family and multiple family census statistics for Guam, the average household per single family dwelling unit is 4.8, and the average household per multiple family dwelling unit is 3. Applying these figures to the number of dwellings in Tumon Bay, therefore, yields a total estimated population of 2,745, as shown in Table II-1.

TABLE II - 1  
RESIDENT POPULATION ESTIMATE FOR TUMON BAY

|                                     | Number | Dwelling<br>Units | Average<br>People/Unit | Total |
|-------------------------------------|--------|-------------------|------------------------|-------|
| Single-Family<br>Residences         | 229    | 179<br>50         | @4.8<br>@2*            | 960   |
| Apartment                           | 44     | 595               | 3                      | 1,785 |
| ESTIMATED TOTAL RESIDENT POPULATION |        |                   |                        | 2,745 |

\* 50 Dwelling Units at Guam Trankilidat are designed for two occupants per unit.

## 2) Tourists

Tourist population fluctuates with the occupancy rates of hotel accommodations and, consequently, a permanent census does not exist. However, the average daily population can be determined through the following formula:

$$\text{Average Daily Tourist Population} = \frac{\text{Number of Hotel Rooms}}{\text{Rate}} \times \text{Average Occupancy Rate} \times \text{Average Number of Tourists per Room}$$

The number of hotel rooms available in Tumon Bay in Fiscal Year 1980 (October 1979 through September 1980) was 1917. The average annual occupancy rate during this period was 78%. The average number of tourists per room is 2. Total estimated average tourist population per day, therefore, is:

$$1917 \times .78 \times 2 = 2991$$

## C. PUBLIC FACILITIES

The Government of Guam operates three types of public facilities in Tumon. They are parks and recreation areas, the Department of Public Safety Tumon Substation and the Guam Visitors Bureau Tumon Branch Office.

### Parks and Recreation Facilities

The Department of Parks and Recreation maintains four park and recreation sites in Tumon Bay. They are Ypao Beach Park, Matapang Park, Laderan Overlook and the Tumon Ball Field.

**Ypao Beach Park** - This 30-acre park is Guam's most visited public recreation facility. In 1980 approximately 125,000 visitors used its facilities, including occasions such as mass rallies, entertainment performances and the Government of Guam's annual Labor Day Picnic.

The inventory at this facility now includes:

- Bandshell
- Large pavilion
- 18 Small picnic pavilions
- Two restroom buildings (one with outdoor shower)
- 2 volleyball courts
- Approximately 18 acres of open, grassed area
- 2 parking lots accommodating approximately 120 vehicles
- 671 linear feet of beach with lifeguard stands
- Dredged swimming area approximately one-quarter acre in size.

**Matapang Park** - This small beachfront park was opened to the public in 1979. It is approximately 5.2 acres in size with 191 linear feet of beachfront. Picnic tables and open areas are available. Parking is not organized and, therefore, usually occurs among the facilities.

**Laderon Tumon Overlook** - This beautifully situated overlook was dedicated in 1975. Although not well used, it provides a panoramic view of Tumon Bay. The overlook has a restroom building and a parking area and is approximately 2.6 acres in size.

Tumon Ballfield - This 2.3 acre ballfield is the only neighborhood recreation facility in Tumon. Despite its substandard size for officially sanctioned Little League, the field is well used by local teams. It has a backstop, fence and a small parking area.

#### Public Safety Substation

In 1980 the Department of Public Safety inaugurated a Tumon Substation on San Vitores Road, near the Tumon Road intersection. This substation and law enforcement presence in Tumon was planned several years ago by the Department. A Corporal and two beat officers are permanently assigned to conduct routine enforcement along the beach and interior areas of Tumon. Emphasis is concentrated in the tourist occupied areas.

#### Guam Visitors Bureau Branch Office

The Guam Visitors Bureau opened a temporary branch office in Tumon at the same site as the DPS Substation. The purpose of this branch office is to disseminate tourist information and have a closer, official point-of-contact with tourists and tourist industry businesses in Tumon Bay.

GVB plans to construct its permanent main office in Tumon, and \$ 250,000 have been appropriated for this project.

#### D. INFRASTRUCTURE

Tumon Bay infrastructure, including water, sanitary sewer, power, telephone, vehicular circulation and storm drainage, were described in a June 1980 technical report entitled, "Tumon Bay Tourism Development Feasibility Study." This report is enclosed as Appendix A as a reference for an inventory of infrastructure throughout the project area. The report is also used as a technical reference for Chapter XI.

#### E. HOTELS AND COMMERCIAL FACILITIES

Eleven hotels are situated in Tumon Bay. They are:

- Guam Hotel Okura
- Guam Reef Hotel
- Hotel Joinus
- Fujita Guam Tumon Hotel
- Terraza Tumon Villa Hotel
- Guam Suehiro Hotel
- Guam Dai-Ichi Hotel
- Pacific Islands Hotel and Beach Colony
- Pacific Islands Club
- Guam Hilton International Hotel
- Dai-Ichi Annex Hotel

Table II-2 summarizes the physical characteristics of these hotels.

Table II-3 summarizes the economic characteristics of the facilities.

TABLE II- 2  
PHYSICAL CHARACTERISTICS OF TUMON BAY HOTELS

| NAME OF PROPERTY                     | NUMBER OF ROOMS | OTHER ACCOMMODATIONS                                                                               | RETAIL FLOOR SPACE |        | TOTAL FLOOR SPACE |        |
|--------------------------------------|-----------------|----------------------------------------------------------------------------------------------------|--------------------|--------|-------------------|--------|
| GUAM HOTEL OKURA                     | 226             | Banquet rooms, pool, 4 restaurants, bar and cocktail lounge, beauty shops, tennis courts           | 3,000              | sq. ft | 164,000           | sq.ft  |
| GUAM REEF HOTEL                      | 300             | Restaurants, lounge, poolside bar, pool, disco, shopping                                           | 14,210             | sq. ft | 168,770           | sq. ft |
| HOTEL JOINUS                         | 36              | 4 restaurants, lounge, pool shopping arcade                                                        | 2,617              | sq. ft | 13,717            | sq. ft |
| FUJITA GUAM TUMON                    | 283             | 5 restaurants, pool, tennis courts, game center, gift shops, meeting facility, convention facility | 2,640              | sq. ft | 90,500            | sq. ft |
| TERRAZA TUMON VILLA                  | 19              | Restaurant, bar                                                                                    | 1,200              | sq. ft | 14,800            | sq. ft |
| GUAM SUEHIRO HOTEL                   | 38              | Restaurant, bar                                                                                    | 4,536              | sq. ft | 16,328            | sq. ft |
| GUAM DAI-ICHI HOTEL                  | 202             | 8 restaurants, bar, nightclub, pool, conference room                                               | 8,908              | sq. ft | 117,515           | sq. ft |
| PACIFIC ISLANDS HOTEL & BEACH COLONY | 205             | 2 restaurants, bar, nightclub pool, gardens, conference, 250 seats                                 | 6,000              | sq. ft | 77,358            | sq. ft |
| PACIFIC ISLANDS CLUB                 | 121             | N/A                                                                                                | 70                 | sq. ft | 67,513            | sq. ft |
| HILTON INTERNATIONAL                 | 380             | 3 restaurants, bar, nightclub,                                                                     | 2,300              | sq. ft | 226,276           | sq. ft |
| DAI-ICHI ANNEX                       | 193             |                                                                                                    | 3,255              | sq. ft | 130,279           | sq. ft |

N/A = Data are not available

**TABLE II-3**  
**ECONOMIC CHARACTERISTICS OF TUMON BAY HOTELS**

| NAME OF PROPERTY                        | 1981 ESTIMATED<br>REPLACEMENT COST | 1980 AVERAGE<br>OCCUPANCY RATES | EMPLOYEES | 1980<br>TOTAL WAGES | AVERAGE<br>HOURLY WAGE<br>PER POSITION | RETAIL SALES<br>(1980) |
|-----------------------------------------|------------------------------------|---------------------------------|-----------|---------------------|----------------------------------------|------------------------|
| GUAM HOTEL OKURA                        | \$ 12 million                      | 86%                             | 190       | \$ 1.7 million      | \$ 3.65                                | \$ 5.5 million         |
| GUAM REEF HOTEL                         | \$60,000,00<br>per guestroom       | 85%                             | 230       | \$ 1.9 million      | \$ 3.68                                | \$ 7.4 million         |
| HOTEL JOINUS                            | \$400,000                          | 65%                             | 10        | \$80,000            | \$ 3.90                                | \$ .41 million         |
| FUJITA GUAM TUMON                       | N/A                                | 70%                             | 110       | \$65,000            | \$ 3.85                                | \$ 3.0 million         |
| TERRAZA TUMON VILLA                     | N/A                                | 65%                             | 8         | \$40,000            | \$ 3.65                                | N/A                    |
| GUAM SUEHIRO HOTEL                      | N/A                                | 40%                             | 6         | \$24,000            | \$ 3.70                                | \$ 1.9 million         |
| GUAM DAI-ICHI HOTEL<br>& ANNEX          | N/A                                | 70%                             | 237       | \$1.66 million      | \$ 3.74                                | \$ 3.9 million         |
| PACIFIC ISLANDS HOTEL<br>& BEACH COLONY | \$ 1.1 million                     | 77%                             | 155       | \$ 1.3 million      | \$ 4.43                                | N/A                    |
| PACIFIC ISLANDS CLUB                    | \$ 3.5 million                     | 40%                             | 95        | \$ .9 million       | \$ 4.93                                | N/A                    |
| HILTON INTERNATIONAL                    | \$55,000<br>per guestroom          | 92%                             | 300       | N/A                 | \$ 3.60                                | N/A                    |
| NA = Data are not available             |                                    |                                 |           |                     |                                        |                        |



## F. RESIDENCES

The project area contains 229 single family residential units and 44 apartment buildings. Within the apartment buildings are 595 dwelling units. Therefore, the total number of residential dwelling units are 824.

Residential units have accounted for the largest number of new construction projects during the past six years, as depicted in Table II-4 and II-5.

TABLE II-4  
BUILDING PERMITS FOR SINGLE FAMILY RESIDENCES

|                  | 1975   |          | 1976   |          | 1977   |           | 1978   |          | 1979   |          | 1980   |          |
|------------------|--------|----------|--------|----------|--------|-----------|--------|----------|--------|----------|--------|----------|
|                  | Number | Value    | Number | Value    | Number | Value     | Number | Value    | Number | Value    | Number | Value    |
| New Construction | 3      | \$51,000 | 3      | \$90,000 | 5      | \$206,250 | 2      | \$48,000 | 0      | 0        | 0      | 0        |
| Additions        | 1      | \$22,000 | 3      | \$43,500 | 6      | \$71,200  | 4      | \$19,400 | 3      | \$67,000 | 4      | \$20,500 |

Source: Division of Building Permits, Department of Public Works

TABLE II-5  
BUILDING PERMITS FOR APARTMENTS

|                  | 1975   |           | 1976   |       | 1977   |       | 1978   |          | 1979   |           | 1980   |           |
|------------------|--------|-----------|--------|-------|--------|-------|--------|----------|--------|-----------|--------|-----------|
|                  | Number | Value     | Number | Value | Number | Value | Number | Value    | Number | Value     | Number | Value     |
| New construction | 1      | \$325,000 | NA     | NA    | NA     | NA    | NA     | NA       | 1      | \$126,000 | 1      | \$550,000 |
| Addition         | 2      | \$ 3,500  | NA     | NA    | NA     | NA    | 2      | \$53,980 | 1      | \$ 11,200 | 5      | \$143,000 |

Source: Division of Building Permits, Department of Public Works  
NA = Data are not available.

## CHAPTER III

### GUAM'S TOURISM INDUSTRY

#### A. AN ECONOMIC ASSESSMENT OF TOURISM AND TUMON BAY

The number of visitor arrivals to Guam has increased four-fold during the last ten years. In 1970, there were less than 75,000 visitors; in 1980, the number was over 300,000. Because of this increase, tourism has become a critical sector of Guam's economy. Since virtually every tourist was based on Tumon Bay, an assessment of Guam tourism is synonymous with an economic assessment of Tumon tourism.

The importance of tourism to Guam is best understood by looking at its effect on gross business receipts, government revenue and employment.

##### Gross Business Receipts

Expenditures per visitor have been estimated at \$500. Based on this, direct visitor expenditures on Guam totalled approximately \$150 million in 1980. This compares with an estimated expenditure of \$128 million for the prior year.

In 1979, total gross business receipts for Guam were \$977 million. Thus, direct visitor expenditures accounted for 13.5% of total gross business receipts.

Since 1980 visitor arrivals were up 14% over the number arriving in 1979.

##### Taxes and Government Revenue

Visitors provide a substantial amount of revenue for the operations of the Government of Guam. In 1980, more than \$1.5 million in hotel occupancy taxes were collected. The amount of taxes collected from this 10% levy has more than doubled since 1976.

An even larger amount was realized from the gross business receipts tax. With approximately \$125 million being spent by visitors on items that are subject to this 4% tax, collections are estimated at about \$5 million in 1980.

##### Employment

Tourism creates considerable employment. One study estimated that, in 1977, some 3,000 to 4,000 jobs depended directly on tourism. Other studies suggest the number might be even higher, to 5,329.

A recent survey concluded that over 1,350 jobs existed in the island's hotels. This does not count the jobs in the other tourist businesses such as tour companies, restaurants and retail shops that are outside the hotels.

According to the Bureau of Labor Statistics, Department of Labor, Government of Guam, the total number of employees in March 1977, was 31,000 of which 17,000 were in the private sector. Based on this, tourism probably accounted for between 18% and 31% of all the jobs in the private sector.

The above discussion includes only the direct benefits of tourism: Indirect benefits are substantial, as well, though their precise effect is much harder to determine. The total gross business receipts of the island's economy are indirectly influenced by tourism. Because tourism is a leading sector, every dollar spent results in additional expenditures that are much greater than would result from an initial expenditure in a non-leading sector, such as non-tourist retail trade.

Tourism indirectly benefits government revenues as well. Because of the multiplier effect, each tourist dollar, which is taxed at 4%, creates additional expenditures which are also taxed at 4%. While no studies of this effect have been undertaken for Guam, there are estimates available for Hawaii. According to the Baumol study, every tourist dollar spent in Hawaii results in a total take by the government of 21 cents. If the same is true for Guam, it would mean that the government coffers received more than \$30,000,000 in revenue from the estimated \$150,000,000 spent by visitors in 1980.

It should be noted that the direct taxes attributable to the visitor industry do not reflect non-tax revenue collected by the Government of Guam. For example, the Guam Airport Authority is obviously dependent on the tourist trade for much of its revenue. Yet, the payments made by visitors for their airplane tickets are usually purchased outside the territory. Still, these payments eventually pay much of the airport's expenses.

Some studies have been done to estimate the indirect benefits to employment on Guam which result from tourism. These estimates range from 500 to 3000 jobs. Adding the indirect jobs to the direct jobs gives a total of 3,500 to 8,329 jobs.

#### ECONOMIC PROJECTIONS FOR TOURISM

From the foregoing, it is obvious that tourism is vital to the island's economy. In the next ten years, it seems probable that tourism will become even more important. Tourism's increasing importance is not so much a result of expectations that the industry will continue to grow rapidly (though steady, if not spectacular, growth seems likely). Rather, it's due to the fact that tourism is probably the only industry that has any chance of stimulating the growth that will be required during the next ten years. This is best shown by looking at the island's employment needs between now and 1990.

According to the Overall Economic Development Plan, the labor force is expected to grow between 41% and 52% in the 1980's. Consider where these jobs are likely to come from.

The public sector employed 15,700 people as of January 1980. This was 40% of total island employment. Of these 15,700 jobs, 9,000 were in the Territorial government, and 6,700 were with the Federal government.

Between September 1970 and January 1980, 14,000 additional jobs were created, of which 3,500 were with the Territorial government; the Federal government experienced no net increase in jobs during this period.

Thus, though the public sector provides 40% of the total number of jobs, it is the private sector which has been creating the bulk of the new jobs in the last ten years. It is likely that this situation will continue to exist. Guam has little control over federal employment, and it seems unlikely that there will be much, if any, increase in federal employment in the next few years. In fact, if anything, it would appear that the chances of decreases in employment are as great as the chances of increases.

The Territorial government is also unlikely to be able to provide a significant number of the new jobs that will be needed. Though there were some ups and downs, the number of Territorial government jobs actually decreased between March 1973 and January 1980.

Another consideration is that funds from various federal programs constitute a significant source of revenue for the Territorial government's programs. Thus, the same conditions that cast doubt on the federal government's likelihood of creating new jobs affect the Territorial government's prospects, too.

Therefore, it seems likely that, barring an unexpected huge, military buildup, job creation by the public sector will be minimal, at best. In fact, it is likely that decreases in this sector will occur, thus pushing an additional burden on the private sector.

Within the private sector, several industries offer some promise. Agriculture and fishing are industries that are commonly cited as having much potential for growth. While this is true, they are such small industries that, even with a concerted effort, their development is not likely to make a major contribution to the economy within the next ten years.

Manufacturing is another industry with possibilities. It is already an important industry, so substantial growth would seem to offer the prospect of significant new employment. However, the sales and growth figures for this industry are dominated by one business, the petroleum refinery. Its growth has been considerable. Unfortunately, petroleum refining is a very capital-intensive business: though it accounts for 90% of total gross business receipts for manufacturing, it employs only 10% or so of manufacturing employees.

Discounting the 120 or so employees of the refinery, manufacturing employment has been stable for the past ten years. Therefore, though manufacturing may have the potential of creating jobs in the next ten years, the experience of the past ten suggest that the number is not likely to be significant in comparison to the total number that will be needed.

Commerce has also been identified as an area that is expected to grow and provide new jobs. Commerce is a catch-all term, encompassing activities as diverse as banking health care, ship-building, research and development and higher education. Some of these business activities, such as health care and higher education, are already making important contribution to the economy. These contributions can probably be expected to increase modestly in the next ten years. Others, however, merely have potential. Since they are starting out from a very small base, their contributions are likely to be minor in the next few years.

Other industries such as retail and wholesale trade presently employ many people, and they are expected to employ many more in the future. However, they are not leading sectors. That is, if the economy grows substantially, they can be expected to increase their employment, perhaps also substantially. However, they react to and complement the industries that stimulate growth in the economy; they do not, as leading sectors do, stimulate growth by themselves.



It is difficult to see where the public sector and the industries in the private sector, that were just mentioned, can provide the growth needed to create the jobs that will be required. Of the leading sectors, the federal government is the one that could be the greatest effect, because it is the largest. The prospects for growth in federal expenditures and employment are poor. Many of the industries in the private sector have excellent prospects; however, it will likely take years for this potential to be turned into sizeable revenues.

Through the process of elimination, then, it appears that there is little choice: If the number of jobs that will be needed are to be created, the tourist industry will have to be responsible for creating many of them. Fortunately, tourism seems to have many of the right qualifications for that task.

The first qualification is size. Tourism is already the second largest sector of Guam. Substantial growth will result in substantial increases in the island's gross business receipts. This will, of course, have immediate effects on government taxes and revenue. The effects on employment are not quite as apparent, however. Some people believe that the tourist industry can absorb as much as an additional 30% growth without a comparable increase in employment. On the other hand, they point-out that construction of additional facilities will result in considerably more jobs even without much growth in visitor arrivals. It is certainly possible, then, that growth in employment will be considerably smaller than the growth in visitor arrivals if this growth results in few new hotels, restaurants, and the like, despite very high rates of patronage to those facilities.

The second qualification is that the industry be a lead sector. Tourism is a lead sector because it results in the transfer of money from outside Guam in exchange for services provided by persons and businesses on Guam.

The third qualification is that it has potential for growth. Though there were some weak years, on balance, tourism exhibited remarkable strength between 1970 and 1980. While percentage increases of the magnitude exhibited during this period are not expected in the coming decade, sizeable increases are anticipated. The Guam Visitors Bureau projects a 10% annual increase. Though others feel that it will not be that high, there still is general optimism that growth will be good.

Based on the above, it seems likely that tourism will have to be the leading sector in the coming years if the economy and employment situations are to be healthy. The industry's own efforts should be sufficient to create many new jobs and provide much of the growth for the island's economy. Whether this will be sufficient to provide all the jobs needed is not known. This depends on the contributions made by the public sector and the rest of the private sector. What is apparent, though, is that the burden of this responsibility falls on the tourist industry.

## CHAPTER IV

### VISITOR ARRIVALS AND ACCOMMODATIONS

In order to determine the number of hotel rooms necessary to accommodate Tumon Bay visitors, a projection of visitor arrivals is required. From such a projection, certain assumptions such as length of stay, room occupancy and hotel occupancy rates can be applied to a formula for determining a range of accommodations that Guam should provide during the foreseeable future.

#### A. ESTIMATED VISITOR ARRIVALS

There is a considerable difference of opinion about the prospects for growth in visitor arrivals. In a study done for the Guam Aquarium, Earl R. Combs, Inc. projected a modest 2.5% growth rate between 1980 and 1990. The Nomura Research Institute, on the other hand, projects a 9.6% increase during the same period. Both of these studies are based on projected increases in Japanese travelers, who account for the bulk of visitors to Guam.

The Guam Visitors Bureau (GVB) is anticipating a 10% annual growth rate during the 1980's, while a major corporation in Guam's tourist industry is projecting a 5% growth rate.

The reason for the disparity in expectations is that complex variables are involved in the determination of the number of arrivals. The sheer number of variables that have an influence on arrivals, the constant changes in the variables over time, the difficulty in assigning "weights" to each of the variables relative to the influence each exerts on arrivals, and the inter-relatedness of the variables combine to make arrival projections extremely difficult.

This difficulty can best be seen by examining some of the more important variables. They are divided into three somewhat arbitrary classifications:

##### Availability of Facilities

In Tumon Bay, the limiting facilities are primarily hotel rooms. Obviously, if there are enough rooms for only 300,000 visitors, tourism will show little or no increase once the number of arrivals reaches that figure.

Theoretically, this could include other facilities such as ground transportation, restaurants, etc. as well. Practically speaking, though, these are not likely to prove limiting variables.

##### Availability of Air Transportation

As with hotel rooms, the number of airline seats available has a strong influence on visitor arrivals. Once airline seats are being filled at or near capacity on a regular basis, arrivals can increase only as new seats are added to the route. Though arrivals by ship are increasing, they are now, and likely will remain, a very small percentage of total arrivals.

While Guam's tourism picture has been improving in the last couple of years, tourism in most other areas has been down. Even Hawaii, which is most often mentioned as Guam's major competitor, has recently shown a decrease for the first time in 30 years. Even though the number of eastbound (primarily Japanese) visitors to Hawaii has increased during this period, the increase has been smaller than the increase experienced on Guam. This is a very encouraging sign for Guam.

The oil situation at the present time also bodes well for the near-term future of the visitor industry in Tumon Bay. With a glut on the market, and a freeze on prices by OPEC, air fares can be expected to increase only moderately in the near future. The oil situation has a second influence on the number of visitor arrivals, since it can have a very significant effect on the Japanese economy, which in turn affects the money that the Japanese have to spend on travel. Because Japan is completely dependent on imported oil, shortages and/or large price hikes affect Japan much more than countries that have their own oil resources. Thus, the existing oil situation will likely encourage more travel by the Japanese, with Guam, hopefully, getting its share.

It seems very likely, then, that Guam's visitor arrivals will continue to increase. It is not, though, probable that the increase will be at the level experienced in the past decade, if for no other reason than the fact that double-digit increases are difficult to sustain over a long period of time, particularly since the base amount is now much higher than it was even ten years ago. For instance, a 10% annual growth rate in 1981 will require only 30,000 more arrivals than 1980. If the 10% rate were sustained, by 1990 about 75,000 more arrivals would be needed than occurred in 1989.

It is certainly not inconceivable that annual increases could average more than 10% in the next ten years. In fact, a study done by the Stanford Research Institute, in 1974, stated that "... accommodation of about one million visitors by 1980 would not be an unreasonable expectation if the industry were encouraged to grow as in the past by tax and other financial incentives." Still, while such growth might be possible, there is little to indicate that such rapid growth is probable.

A reasonable range of estimated visitor arrivals over the next ten years seems to be 5-10%. The most recent figures suggest that the average growth will be at least 5%, and the size of the statistical base, combined with a lack of information to suggest that double-digit increases can be maintained, indicated that 10% is probably about the upper limit.

Table IV-1 shows estimated visitor arrivals for the years 1981 through 1990 for four different growth rates. At a 2% annual increase, annual arrivals would be only 22% higher in 1990 than in 1980. At 10%, annual arrivals would be 160% higher in 1990. If the estimated increase in arrivals holds true, visitors in 1990 will number between 490,000 and 780,000.

It should be noted, once again, that this 5-10% estimate could be made obsolete by a number of factors. Increases in the amount and price of oil, the effect of competition from other resort areas, the general health of the Japanese economy, Guam's encouragement of the tourist industry, the loss or addition of air routes, and changes in Tumon Bay's tourist plant are all examples of factors that could, individually or in combination, place the growth rate outside the 5-10% range.

TABLE IV-1  
ESTIMATED VISITOR ARRIVALS

| Year | 2% annual<br>increase | 5% annual<br>increase | 8% annual<br>increase | 10% annual<br>increase |
|------|-----------------------|-----------------------|-----------------------|------------------------|
| 1980 | 300,000               | 300,000               | 300,000               | 300,000                |
| 1981 | 305,000               | 315,000               | 325,000               | 320,000                |
| 1982 | 310,000               | 330,000               | 350,000               | 365,000                |
| 1983 | 320,000               | 345,000               | 380,000               | 400,000                |
| 1984 | 325,000               | 365,000               | 410,000               | 440,000                |
| 1985 | 330,000               | 380,000               | 440,000               | 485,000                |
| 1986 | 340,000               | 400,000               | 475,000               | 530,000                |
| 1987 | 345,000               | 420,000               | 515,000               | 585,000                |
| 1988 | 350,000               | 445,000               | 555,000               | 645,000                |
| 1989 | 360,000               | 465,000               | 600,000               | 705,000                |
| 1990 | 365,000               | 490,000               | 650,000               | 780,000                |

Note: All figures rounded to the nearest 5,000.

#### B. HOTEL ROOMS REQUIRED

The number of hotel rooms that will be needed in Tumon Bay to accommodate the expected increase in visitors is a function of several things, including:

- \* The number of visitors staying in Tumon Bay hotel rooms;
- \* The average length of stay;
- \* The average number of persons per room;
- \* The desired occupancy rate; and
- \* The seasonality of visitor arrivals.



Table IV-2 shows the number of hotel rooms that will be needed between 1982 and 1990, at 70%, 80%, and 90% occupancy rates, for both a 5% and 10% increase in visitor arrivals.

TABLE IV-2  
NUMBER OF HOTEL ROOMS REQUIRED

| Year | w/5% annual visitor increase |      |      | w/10% annual visitor increase |      |      |
|------|------------------------------|------|------|-------------------------------|------|------|
|      | occupancy rate               |      |      | occupancy rate                |      |      |
|      | @70%                         | @80% | @90% | @70%                          | @80% | @90% |
| 1982 | 2400                         | 2050 | 1850 | 2650                          | 2300 | 2050 |
| 1983 | 2500                         | 2150 | 1900 | 2900                          | 2550 | 2250 |
| 1984 | 2650                         | 2300 | 2050 | 3200                          | 2800 | 2500 |
| 1985 | 2750                         | 2400 | 2150 | 3550                          | 3100 | 2750 |
| 1986 | 2900                         | 2550 | 2250 | 3900                          | 3400 | 3000 |
| 1987 | 3050                         | 2650 | 2350 | 4300                          | 3750 | 3300 |
| 1988 | 3250                         | 2850 | 2500 | 4750                          | 4150 | 3650 |
| 1989 | 3400                         | 2950 | 2600 | 5200                          | 4550 | 4000 |
| 1990 | 3600                         | 3150 | 2750 | 5750                          | 5050 | 4450 |

Note: Based on 4 nights/tourist, 2 tourists/room, 365 days/year.  
Rounded to the nearest 50.

The projections are based on increases over the 1980 visitor arrival figure of 300,000. It is assumed that each visitor stays four nights, and that there are an average of 2 persons per room. These three assumptions, however, introduce errors into projections, because it is unlikely that the statistical average for nights per visitors and visitors per room are exactly 4.0 and 2.0, respectively. In addition, some of the visitors to Guam do not stay in hotel rooms in Tumon Bay. To allow for these corrections, these assumptions were used to predict the occupancy rate for hotels in 1980, and then the assumptions are compared against the actual rate experienced that year.

Using these assumptions, the occupancy rate for 1980 would have been expected to be about 88%, rather than the approximate 80% that actually occurred. (Actual occupancy rates were listed at 79%, but this is for fiscal year 1980 and does not include the last three months of the calendar year.) Thus, the assumptions are causing errors of approximately 170 rooms, or 9.1% of total rooms projected.

It is not clear to what degree each of the assumptions contribute to the error. If the number of visitors staying on Guam, outside of Tumon Bay, is primarily responsible, then the rest of the projections should be adjusted by subtracting approximately 170 rooms from each total. On the other hand, if the statistical

averages are responsible for the bulk of the difference, then the projections should be adjusted downward 9.1%. At 2,000 rooms, of course, there is little difference; but at 3,000 rooms, the adjustment made on a percentage basis would be 270 rooms versus 170.

For the purposes of the Table it was decided to use a combination of the two adjustments. The rooms are projected on the basis of the assumptions, then 100 rooms are subtracted, and the balance is multiplied by .96.

The Table shows that at a 5% average growth rate the present hotel rooms can absorb the increase through 1983, though by that time average occupancy will be above 90%. (This is based on hotel rooms in Tumon Bay, available to visitors, totalling 1,859). Assuming that 90% is the highest realistic sustainable occupancy rate, the shortfall of hotel rooms would increase about 125 rooms a year, on the average, between 1984 and 1990. Thus, approximately 900 new hotel rooms will be needed during that period.

At a 10% average annual growth rate, about 400 new rooms would be needed by 1983, and 2,600 would be needed by 1990.

The determination of the number of hotel rooms required must also take into account the seasonality factor see Table IV-3, below.

TABLE IV-3  
SEASONALITY OF VISITOR AIR ARRIVALS

| Month            | 1971    | R<br>A<br>N<br>K | 1974    | R<br>A<br>N<br>K | 1977    | R<br>A<br>N<br>K | 1978    | R<br>A<br>N<br>K | 1979    | R<br>A<br>N<br>K | 1980    | R<br>A<br>N<br>K |
|------------------|---------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|------------------|
| Jan              | 74.0    | 10               | 79.6    | 4                | 60.2    | 11               | 67.9    | 7                | 64.2    | 10               | 71.9    | 5                |
| Feb              | 83.5    | 5                | 76.8    | 5                | 78.9    | 4                | 65.3    | 9                | 72.2    | 3                | 77.9    | 4                |
| March            | 94.5    | 2                | 100.0   | 1                | 95.3    | 2                | 97.8    | 2                | 85.3    | 2                | 78.9    | 3                |
| April            | 92.6    | 3                | 68.0    | 9                | 75.9    | 6                | 62.1    | 10               | 63.4    | 12               | 60.5    | 12               |
| May              | 80.4    | 7                | 70.4    | 8                | 90.8    | 3                | 66.4    | 8                | 68.0    | 7                | 71.9    | 6                |
| June             | 100.0   | 1                | 56.1    | 11               | 71.1    | 8                | 48.5    | 12               | 66.8    | 9                | 66.0    | 8                |
| July             | 57.7    | 11               | 56.6    | 10               | 67.5    | 9                | 74.5    | 3                | 68.6    | 6                | 88.3    | 2                |
| Aug              | 91.1    | 4                | 92.3    | 2                | 100.0   | 1                | 100.0   | 1                | 100.0   | 1                | 100.0   | 1                |
| Sept             | 54.0    | 12               | 53.8    | 12               | 53.6    | 12               | 53.6    | 11               | 67.2    | 8                | 64.4    | 10               |
| Oct              | 83.4    | 6                | 72.7    | 7                | 76.0    | 5                | 69.8    | 4                | 71.3    | 5                | 64.5    | 9                |
| Nov              | 79.8    | 8                | 79.6    | 3                | 74.6    | 7                | 68.5    | 6                | 72.1    | 4                | 69.8    | 7                |
| Dec              | 78.3    | 9                | 75.6    | 6                | 66.8    | 10               | 68.8    | 5                | 63.4    | 11               | 63.7    | 11               |
| Yearly<br>Totals | 119,174 |                  | 260,568 |                  | 240,467 |                  | 231,975 |                  | 264,326 |                  | 291,133 |                  |
| Lowest<br>%      | 54      |                  | 53.8    |                  | 55.8    |                  | 48.5    |                  | 63.4    |                  | 60.5    |                  |

Note: The month with the highest number of arrivals was assigned a percentage of 100. All other months are expressed as a percentage of the highest month.

Table IV-3 shows the seasonality of visitor arrivals for six years between 1971 and 1980, including 1977-1980. For each year, the month with the highest number of visitor arrivals was assigned a percentage of 100, and all other months are expressed as a percentage of the highest month. As shown by this Table, there are considerable differences in arrivals between the months. For example, in 1980, all months except July are at least 20% lower than the highest month. The lowest month in 1980 was only 60.5% of the highest month.

Table IV-4 shows the seasonality of occupancy rates for fiscal years 1979 and 1980. While there are still monthly variations, the variations are not nearly as pronounced as in the visitor arrival statistics. Comparing changes in the statistics between 1979 and 1980 in both Tables reveals that there is a substantial disparity between the occupancy rates that would have been expected, given the change in visitor arrivals, and the occupancy rates that were actually experienced. Further, there does not seem to be a common thread to explain the differences.

It is probable that a number of factors account for these differences. The mix between those staying in Tumon Bay and those who do not will vary from month to month; the number of rooms available for visitors may vary somewhat; and it is possible that the methods of reporting and/or collecting the information cause some of the disparity.

TABLE IV-4  
HOTEL OCCUPANCY RATES (%)

| MONTH            | FY 1979 | FY 1980 |
|------------------|---------|---------|
| October          | 68      | 71      |
| November         | 69      | 77      |
| December         | 53      | 62      |
| January          | 63      | 76      |
| February         | 64      | 90      |
| March            | 83      | 91      |
| April            | 61      | 75      |
| May              | 68      | 77      |
| June             | 70      | 72      |
| July             | 72      | 78      |
| August           | 93      | 95      |
| September        | 70      | 72      |
| AVERAGE          | 71%     | 78%     |
| WEIGHTED AVERAGE | 73%     | 79%     |

SOURCE: Guam Visitors Bureau

Seasonality is important because the projected number of hotel rooms is based on annual increases in visitor arrivals. According to the occupancy rate statistics, however, three months are already at 90% occupancy or more. Thus, those months appear to be unable to absorb much of an increase. It seems that the annual increase in arrivals will be reduced over what it otherwise would have been because monthly arrivals in the three best months (in 1980, at least) will contribute very little to the increase.

On the other hand, though visitor arrivals increased 8% in August 1980 over the number in August 1979, the occupancy rate increased only from 93% to 95%. By the same token, though visitor arrivals increased a whopping 40% in July 1980 over the same month a year earlier, the hotel occupancy rate increased only from 72% to 78%.

Based on the above, a reasonable assessment of the likely effects of seasonality is that at a 90% annual occupancy rate, four to five months will show occupancy rates well above 90%, one or two will show rates at less than 80%, and the rest will be between 80% and 90%.

Does this mean that the seasonality of travel to Guam will result in a stunting of the growth rate due to would-be visitors unable to obtain accommodations in the peak months? Possibly so, since the Table on visitor arrivals shows continuing high seasonality year after year. On the other hand, the changes in the occupancy rates vis-à-vis the changes in arrival, suggest that such losses will be smaller than would be expected.

Two solutions to this problem are possible. One, increase the number of hotel rooms to the point that annual occupancy rates are much less than 90%. At 80%, few travellers would be unable to get accommodations, even in the peak months. This, however, is not likely to be a workable solution, as explained later in Chapter XVI, Financing Requirements.

Two, make the travel less seasonal. Encourage visitors to come in the off-season through special promotions, incentives, etc. While hotels and airlines are already promoting the non-peak months, and have succeeded in raising the number of visitors in these periods, there has, nonetheless, been little reduction in the overall seasonality of arrivals.

From the foregoing, it is estimated that 900 additional rooms will be needed by 1990, based on a 5% annual growth rate, and 2600 rooms will be required if the assumed growth rate is 10%. The addition of these rooms would still leave occupancy rates near 90%, and there would likely be travellers who could still not be accommodated during some of the peak months. Planning for hotel rooms sufficient to produce an annual occupancy rate of much less than 90% is not recommended.

A suggested schedule for the addition of the hotel rooms is shown in Table IV-5.

TABLE IV-5  
SCHEDULE FOR ADDITIONAL  
HOTEL ROOMS

| Date of completion | No. of rooms<br>@ 5% growth | No. of rooms<br>@10% growth |
|--------------------|-----------------------------|-----------------------------|
| 1/1/83             | 100 (renovation)            | 100 (renovation)            |
| 1/1/84             | 150 (expansion)             | 150 (expansion)             |
| 1/1/85             | ---                         | 600 (construction)          |
| 1/1/86             | 200 (construction)          | 350                         |
| 1/1/87             | ---                         | 350                         |
| 1/1/88             | 250                         | 300                         |
| 1/1/89             | 200                         | 300                         |
| 1/1/90             | ---                         | 450                         |
| TOTALS             | 900                         | 2600                        |

A schedule such as this would allow for orderly growth in line with the increase in tourist arrivals. The 100 additional rooms planned for 1983 would come from remodeling of existing rooms to add to the present inventory. The 150 additional rooms in 1984 would be expansions of existing hotels. The rest would be new hotels.

If rooms are added under the assumption that a 10% growth rate will be sustained, the number of hotel rooms available will fall short of that needed until 1985. This is because it is unlikely that the potential investors could be persuaded to build enough hotels prior to this. For investors to build on the assumption of a 10% growth rate, they will need to be assured that such a rate is likely. It is unlikely that they would be convinced unless 1981, 1982, and, possibly, 1983 results showed that such a rate was being sustained. Then, allowing for 2 years to completion, these rooms would not be available to visitors before 1985. Obviously, if growth does maintain a double-digit rate, there will be serious shortages of rooms in the years before 1985. This, however, is probably unavoidable.

## PART TWO

### PLANNING METHODOLOGY

This Part of the Master Plan describes the methodology employed to formulate the various plan elements and to determine the strategies for implementing these plans.

## CHAPTER V

### URBAN DESIGN PLANNING

Before describing the planning methodology employed for the Tumon Bay Master Plan, it is beneficial to review urban design planning in general. Urban design is a branch of planning concerned with the functional and visual relationships between people and their physical environment. The intent is, naturally, to improve these relationships. As such, urban design plans traditionally involve the organization of such substantial areas as housing, transportation, open space, public services and commerce.

#### A. URBAN DESIGN PLANS

The underlying assumption of urban design plans, and certainly in the case of Tumon Bay, is that an environment can be planned and designed in order to create a desired physical form. Generally, political and economic forces must be influenced in order to achieve that desired environment. Therefore, urban design usually functions as a part of the public sector where it can stimulate, guide and influence development in a manner which is mutually beneficial to the private sector.

Urban design is properly a function of the Government of Guam, and the Government has significant authority and powers that affect the Tumon Bay urban design plan. They include zoning ordinances and subdivision regulations as well as supplemental design review procedures for development in the Resort (H) Zone throughout Tumon Bay. Also, through its comprehensive planning process and infrastructure planning, the Government influences the type, location and character of both private and public development throughout the area. Lastly, the Government directs actual design features through such public facilities in Tumon Bay as streets, parks and major projects (Guma Trankilidat), as well as other proposed public facilities.

With a formal commitment to urban design, the Government of Guam can further enhance the institutional framework for planning by:

- \* Establishing and enforcing legal controls and incentives for private development through urban design activities;
- \* Undertaking comprehensive and project planning processes that utilize urban design techniques;
- \* Coordinating public facility and infrastructure planning;



- \* Working closely with private developers to influence acceptable development proposals; and
- \* Maintaining an open communication link with the general public, and especially with those people who reside, work, or have other interests in the vicinity of any proposed development.

In this perspective, it is important to understand that urban design is different from the practice of architecture. Urban design is a planning process that involves several Government of Guam agencies, consultation with other public and private agencies and organizations, the collection and analysis of data, and the consideration of all these factors within a defined physical environment. Though intimately related to the urban design process, architecture begins at that point and carries-on through definitive design, contract document preparation and construction management of a building.

## B. URBAN DESIGN PROCESS

The Tumon Bay urban design planning process contains four parts: context, alternatives, choices and implementation. First, the context of Tumon Bay development is examined to relate the Territory's land use and economic goals to the physical resources affected by the project. Second, alternatives are developed to describe various approaches for land use and economic development goals. Third, choices are made using the alternatives as the basis of their relative social, environmental and economic consequences. And lastly, implementation strategies are devised to fit the administrative techniques and financial resources of the Territorial Government.

The emphasis of the Tumon Bay Master Plan, as conceived through the urban design process, is on determining what to do and who has to do it, rather than on the creation of a written document, per se.

### Context

The context of an urban design plan for Tumon Bay is pragmatically defined by the limits of time and money to perform the work. Both constraints impact on the amount of data and the number of people that can be meaningfully involved in the process.

Within the context of this Master Plan, participants included the following groups.

- \* Clients who set the boundaries of the work by establishing the scope of work and providing ongoing reviews.
- \* Related planning disciplines such as architecture, engineering, economics and tourist industry management.
- \* Appropriate governmental interests, including public works, utilities, land management, environmental protection, commerce, tourism, development industry and elected public officials.



- \* Resource groups with direct interest and expertise such as hotel managers, realtors, tourist industries, retailers, bankers, contractors and marine biology.
- \* Individuals who make-up important user interests but must be organized to create a representative group, such as local businessmen, boaters, surfers, landowners and professional organizations.
- \* Broad based community organizations that have an interest in the nature of change within the municipality such as the Tamuning Planning Council and the Guam Chamber of Commerce.

Background data and statistics were largely provided through previous or simultaneous studies and surveys. The urban design process was assisted by such supplemental projects as infrastructure analyses, resident and tourist attitude surveys, a summary of marine studies and project impacts in the Tumon Bay lagoon, and a land use inventory.

#### Alternatives

Developing alternative solutions and plans for the Tumon Bay project provides the principal means of describing the choices available. Once the goals and objectives for development were established, the consultants prepared alternative sketch designs for land uses, San Vitores Boulevard, hotel and resort images, lagoon and shoreline development and infrastructure schemes. The sketches were also supplemented with written and verbal presentations about alternative policies and programs that could achieve Tumon Bay goals. These initial probes into the problems helped to generate discussion and thereby recycle the viable alternatives. This methodology elevated the quality of alternatives to successively higher levels of resolution.

#### Choices

In the course of the decision-making process of urban design planning, choices must be made among alternative solutions. For example, once the alternatives for achieving Tumon Bay land use objectives are well articulated, a conscious selection of one must be determined. Similar choices are imperative for other elements of the Master Plan as well. In situations of limited resources or market capacity to support a particular choice, a sequence of steps may be necessary which eventually lead up to the intended choice. Incremental programming of infrastructure improvements, especially water, sewer and storm drainage, is an example of choices selected on a stepping-stone basis.

The selection process among urban design choices for Tumon Bay also requires an evaluation by the Government of both short-term desires and the efficacy and cost of the alternatives. This type of assessment always draws in the participation of diverse interest groups as well as public and private investors in the area. In order to structure these evaluations to assure the most logical, rational choice reflecting the community's best interests, a framework of analysis is used. This framework is composed of three parts: cost effectiveness, attractiveness and funding emphasis.

From the cost-effectiveness point-of-view, each alternative is first rated by the environmental, social and economic benefits it yields in relation to its cost. This helps to establish an initial list of priorities. The attractiveness criterion deals with such characteristics of the alternatives as community support, ease of implementation, funding availability and likelihood of stimulating the economy in terms of employment, attracting outside investment or yielding a long-term return through some other means.

Taken together, cost-effectiveness and attractiveness allow an overall evaluation of the relative funding emphasis to be placed on each alternative through the decision to commit funds. For example, some alternatives with high cost-effectiveness, such as lagoon dredging to accommodate charter boat businesses, will have associated public support or implementation feasibility (attractiveness criterion) drawbacks, thus lowering the alternative in funding emphasis. All in all, this step in choice-making demands the attention of Government decision makers who possess a comprehensive grasp on the direct and indirect ramifications of each alternative.

### Implementation

The final step in the urban design process is implementation, which is based on feasibility, continuity and incrementalism. These are the three cornerstones that empower urban design as an effective means of improving Tumon Bay. Unless urban design is proven to be a successful planning methodology it will never garner the confidence and support of both local government and private interests.

First, the implementation strategies must be feasible. This involves an understanding of public awareness and support, public and private administrative capability and the limits of public and private funding. Second, continuity of the urban design planning process must be guaranteed in order to react to new information (alternatives) and the results of implementing the selected choices. During any long-term implementation process, original planning and development objectives may alter, and the urban design plan must be responsive to such changes. Lastly, a development plan should be structured to allow for subsequent phases so as to adapt to changing information and emphasis. Projects which are designed as complete entities within each development phase will ensure future flexibility. This type of incrementalism also provides for a sense of completeness in the event that the overall project goals lose support. In summary, feasibility, continuity and incrementalism create a management and planning perspective toward urban design that is deliberately modest and practical, as opposed to the utopian aura of some other planning methodologies.

## CHAPTER VI

### TUMON BAY PLANNING ADVISORY TEAMS

Tumon Bay Planning Advisory Teams (TUBAPATS) were a conduit for both technical resource staff and local advocacy groups to interact while participating in the Tumon Bay planning process. TUBAPATS were happenings. During TUBAPAT worksessions, participants openly discussed and debated various development issues of relevance to the future of Tumon Bay.

"TUBAPAT" consisted of qualified, knowledgeable spokesmen from both the public and private sectors of Guam. Each sector was essentially represented by two basic groups: Resource Staff and Advocacy Groups. Resource staff were from technical agencies responsible for guiding and/or regulating development in Tumon Bay. Advocacy groups represented agencies and organizations which advocate various development trends for Tumon Bay. TUBAPAT participants were specifically invited to participate. The sessions were not open to the public.

Each participant acted as a lobbyist for the agency or organization which he or she represented and spoke with equal authority among all other participants.

#### A. TUBAPAT ONE

TUBAPAT sessions were conducted on two occasions. TUBAPAT ONE convened for four mornings on March 6, 9, 10 and 11, 1981 at the Reef Hotel and dealt with Tumon Bay development objectives, land use issues, San Vitores Boulevard concepts, infrastructure requirements and options, and lagoon use alternatives. TUBAPAT ONE concentrated on the overall "plan" for Tumon Bay. These sessions were attended by approximately 30 representatives of the following agencies and groups.

- Department of Commerce
- UOG Marine Lab
- Guam Visitors Bureau
- Bureau of Planning
- Guam Economic Development Authority
- Department of Parks and Recreation
- Guam Hotel & Restaurant Association
- Surfers Association
- Chamber of Commerce
- Guam Realtors Association
- Commissioner of Tamuning
- U. S. Army Corps of Engineers
- Pan American World Airways
- Territorial Planning Commission
- Department of Public Works
- Calvo Management
- Guam Environmental Protection Agency
- Guam Chapter, American Institute of Architects
- Duty Free Shoppers, Ltd.
- Tourism Consultant
- Architect Consultant
- Engineer Consultant
- Economist Consultant
- Planning Consultant

Each participant was given a TUBAPAT packet several days in advance of the session which contained Guam demographic and economic data, tourism information, Tumon Bay data, sketches of the Tumon Bay Land Use and San Vitores Boulevard conceptual alternatives, and a report about the anticipated impacts resulting from various lagoon improvements.

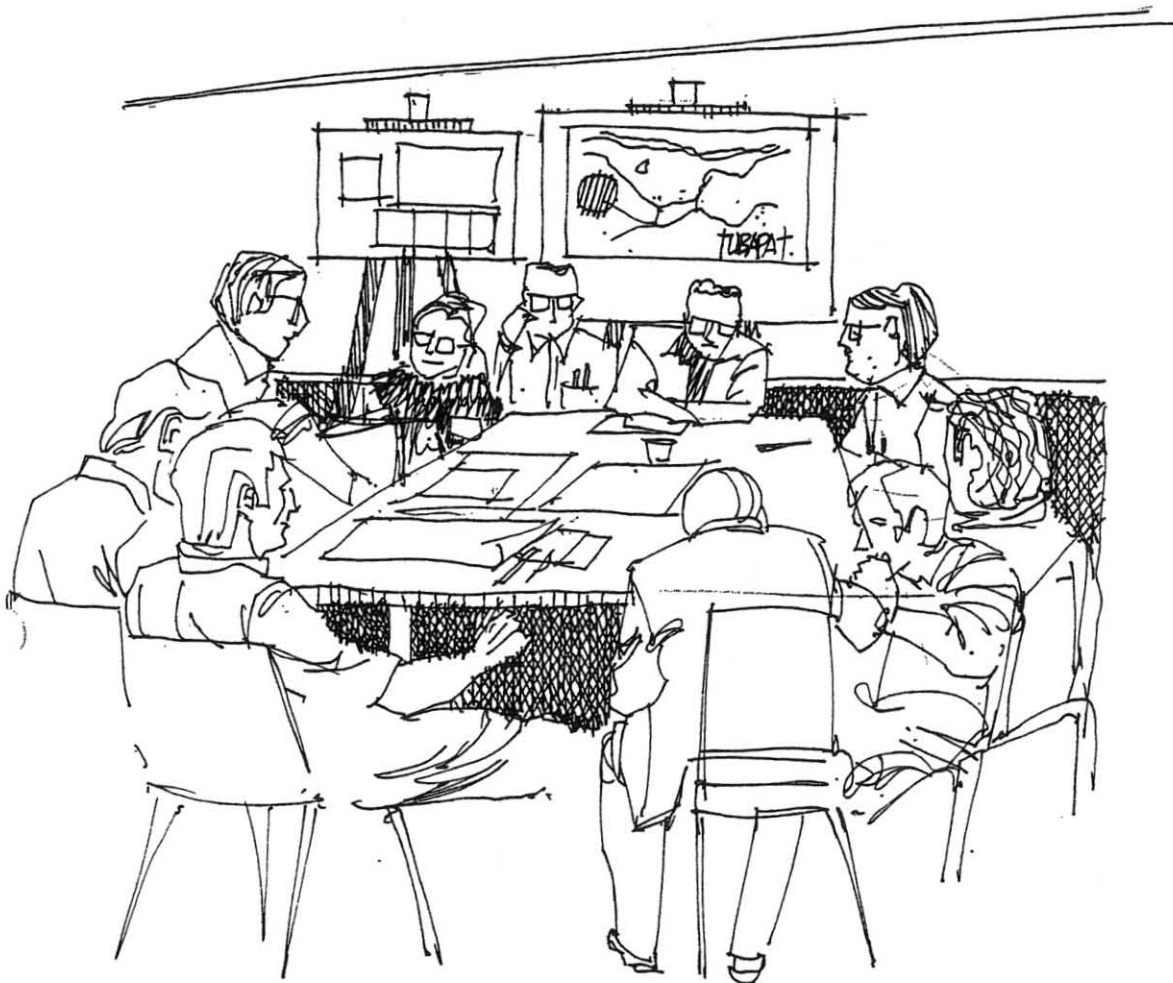
After a technical presentation of the session's subjects during the first hour of each day, the participants reconvened in three work groups. Each workgroup was led by a TUBAPAT leader who was prepared to discuss development issues and alternatives that were relevant to the day's subjects. At the end of each day's session, the leaders recapped their work group's opinions and recommendations for the benefit of the other work groups.

#### B. TUBAPAT TWO

TUBAPAT TWO was conducted during the mornings of April 22, 23 and 24, 1984 at the Dai-Ichi Annex. This session concentrated on means of implementing the various components of the Tumon Bay Master Plan that were conceived in TUBAPAT ONE. The participants changed slightly to reflect those groups and agencies involved with implementation aspects of the Master Plan. Approximately 25 participants attended each session and represented the following agencies and groups.

- Department of Commerce
- Guam Economic Development Agency
- Guam Environmental Protection Agency
- Department of Public Works
- Territorial Planning Commission
- Bureau of Budget & Management Research
- Guam Visitors Bureau
- Department of Parks & Recreation
- Guam Legislature
- Bureau of Planning
- Overall Economic Development Plan Committee
- Duty Free Shoppers, Ltd.
- Guam Bankers Association
- Guam Realtors Association
- Guam Hotel & Restaurant Association
- Guam Contractors Association
- Chamber of Commerce
- American Institute of Architects
- Architect Consultant
- Engineer Consultant
- Tourism Consultant
- Planning Consultant

The issues discussed at these sessions were a review of the recommended land use and lagoon improvements, land use controls and growth management concepts applicable for Tumon Bay, proposed environmental design guidelines, and infrastructure costs and construction schedules. Each participant was given an advance package of information containing:



1. A recap of the proposed land use and lagoon plans developed during TUBAPAT ONE.
2. A review of land use controls and growth concepts for Tumon Bay.
3. Proposed environmental design guidelines.

The format of TUBAPAT TWO paralleled the first TUBAPAT wherein a technical presentation was followed by workgroup discussions and recaps.

TUBAPAT sessions achieved a knowledgeable, technical exchange of ideas and opinions about the most practical and successful plans and implementation strategies for Tumon Bay. Master planning for Tumon Bay was enhanced through the benefit of timely input from people representing a wide range of public and private concerns. There were no guidelines or formalities imposed on TUBAPAT participants. By restricting the sessions to rather small, informal groups at a secluded, comfortable location, these sessions presented the ideal environment to freely participate in the planning process.

## PART THREE

### GOALS AND OBJECTIVES

Part Three of the Tumon Bay Master Plan articulates the various goals, objectives and preferences that have been expressed by tourists, residents, government officials and TUBAPAT's about Tumon Bay. This Part establishes the intended destination towards which the master planning effort is directed.

## CHAPTER VII

### PLANNING AND DEVELOPMENT OBJECTIVES

Planning objectives are the primary guidance system for any Master Plan. For Tumon Bay, many different sources of objectives are available. The first requirement is articulation of the various objectives. Then, where necessary, certain conflicting or otherwise incompatible objectives among the various special, interested groups can be mediated. This Chapter consolidates the objectives and preferences which have been expressed about tourism and Tumon Bay by tourists, residents, Government officials and TUBAPAT's. Their respective viewpoints must be carefully interpreted and analyzed in order to create a set of realistic, accurate planning and development objectives for Tumon Bay.

Fortunately, several current, reliable sources of objectives are available. Both the Department of Commerce and the Guam Visitors Bureau conducted surveys about tourism and Tumon Bay during 1980 and 1981. The Department of Commerce concentrated on an attitude survey of Guam residents regarding tourism, and the Guam Visitors Bureau commissioned an indepth survey of Guam visitors, travel agents and Far East travelers who originated in North America. GVB also conducted a Guam attitude survey among Japanese in 1975.

Other documents, as well, contribute to the articulation of objectives. The 1981 Overall Economic Development Committee, charged by the Governor of Guam to formulate a Comprehensive Economic Development Plan, identified tourism as one of Guam's four prime economic growth sectors and established several goals and objectives relating to both tourism industry development as well as to Tumon Bay development. Some other planning and development objectives are extrapolated from discussions, reports and general experience from among Government officials, local and off-island investors, special interest groups and professional consultants as expressed during meetings of Tumon Bay Planning Advisory Teams. All of these resources are utilized in this chapter.

#### A. THE PREFERENCE OF VISITORS TO GUAM

Visitor preferences are extremely important to the Tumon Bay Master Plan because they set the stage for what is - and for what is not - attracting the tourist and his travel budget to Guam. Insofar as Tumon Bay itself plays a factor in those preferences, care must be taken to accentuate the positive and, literally, eliminate the negative. When the vast majority of visitors are a homogenous group, such as in Guam's case where 72% of all visitors are from Japan, identification of attitudes and preferences must be especially accurate because of the size and influence of the target group. The two sources of preferences are GVB's 1975 survey of Japanese tourists as well as a recent study about visitors from North America.



## Japanese Tourist Attitude Survey

Several years ago the Guam Visitors Bureau commissioned a survey of Japanese visitors, and the results, entitled "The Guam Image Study," were published in February 1976. Many of the statistics contained within this report reveal the image of Guam held by these visitors. An analysis of this information is relevant to determine planning and development objectives for Tumon Bay.

Perhaps the predominant impression of Guam by the Japanese is one of a natural, unspoiled island environment. The top five primary "Images" held by those surveyed include clean ocean, beautiful nature, clean air, good climate and undestroyed nature.

The remaining Guam images are nearly equally divided among such characteristics as blue skies and jungles, southern tropical island, quiet, leisurely tourist area for young people, lots of food, foreign country feeling and war relics.

The particular image of Guam that Japanese found most "attractive" closely paralleled the primary image results with a clean ocean chosen by most and the beautiful nature as second choice. The first choice for "sports" on Guam was, of course, swimming.

The relative importance of various attractions in choosing a travel destination were also rated by the Japanese. The competitive attributes for Guam are apparent, as reflected in Table VII-1.

TABLE VII - 1

IMPORTANCE OF FACTORS IN CHOOSING TRAVEL DESTINATION  
BY JAPANESE

| Factor                  | Very<br>Important |     |     |     |     | Not at all<br>Important | Mean Score |
|-------------------------|-------------------|-----|-----|-----|-----|-------------------------|------------|
|                         | 6                 | 5   | 4   | 3   | 2   | 1                       |            |
| Clean Air & Sea         | 81%               | 13% | 5%  | 1%  | -0- | -0-                     | 5.74       |
| Scenery                 | 74%               | 19% | 5%  | 1%  | -0- | -0-                     | 5.66       |
| Hotels                  | 54%               | 21% | 16% | 5%  | 2%  | 1%                      | 5.17       |
| Reasonable Prices       | 40%               | 27% | 20% | 10% | 2%  | -0-                     | 4.92       |
| Restaurants             | 28%               | 30% | 27% | 8%  | 4%  | 1%                      | 4.66       |
| Pacific Islands culture | 32%               | 22% | 25% | 13% | 4%  | 3%                      | 4.55       |
| Shopping                | 12%               | 23% | 32% | 14% | 13% | 6%                      | 3.88       |
| Night Life              | 14%               | 22% | 26% | 15% | 15% | 7%                      | 3.85       |
| Beaches                 | 17%               | 20% | 24% | 14% | 10% | 15%                     | 3.77       |
| Tropical Climate        | 8%                | 17% | 31% | 27% | 13% | 8%                      | 3.60       |
| Sports                  | 9%                | 13% | 25% | 20% | 17% | 15%                     | 3.29       |



Another analysis of perceived images are revealed through an opinion rating of certain characteristics of Guam, such as "quiet vs. lively", having a "variety of activities vs. limited activities" and offering "exciting night life vs. no night life". These opinions are recorded in Table VII-2.

TABLE VII-2  
RATING CERTAIN PERCEIVED IMAGES OF GUAM

| Rating   | Characteristics of Guam |                                              |                                       |
|----------|-------------------------|----------------------------------------------|---------------------------------------|
|          | Quiet vs. Lively        | Variety of Limited Activities vs. Activities | Exciting No Night Life vs. Night Life |
| Very     | 20%                     | 5%                                           | 4%                                    |
| Rather   | 29%                     | 12%                                          | 21%                                   |
| Somewhat | 23%                     | 17%                                          | 28%                                   |
| Somewhat | 12%                     | 27%                                          | 18%                                   |
| Rather   | 12%                     | 29%                                          | 19%                                   |
| Very     | 4%                      | 9%                                           | 9%                                    |

The particular activities chosen for participation while in Guam by those surveyed were, in order:

|                 |     |
|-----------------|-----|
| Go to beach     | 19% |
| Take it easy    | 14% |
| Sight seeing    | 11% |
| Enjoy scenery   | 10% |
| Visit war sites | 8%  |

The remainder were rather equally divided among different sports, shopping and other pursuits.

The Guam Visitors Bureau's "A Survey of Attitudes Toward Guam," dated March 1981 and prepared by Peter D. Hart Research Associates, Inc. of Washington, D. C. involved only North American travelers. Since only 14% of Guam's visitors are from North America, this study is of less importance than the surveys of Japanese tourists but, nonetheless, relevant to canvassing opinions in order to conceive planning and development objectives. The first of three sections of this document is relevant to this Plan: i.e., The Guam Visitor Survey. This section of the survey addressed the following specifics.

- 1) Analyze the travel history of the sampled Guam visitors in order to determine the nature of Guam's travel market;
- 2) Identify and describe the various disembarking factors in an individual's vacation planning and their implications for attracting visitors to Guam; and
- 3) Define and analyze respondent's attitude toward Guam, both positive and negative, in order to develop a specific informational and marketing campaign.

The remaining two sections of the survey, dealing with travel agents and Far East travelers, are similarly developed but not germane to the scope of this Master Plan.

The visitor attitude survey canvassed 217 North Americans who had visited Guam. Only one-third visited Guam intentionally as a vacation spot. The majority of visits, 59%, were for business reasons, and 22% traveled to the Pacific to visit friends or relatives. Only 21% of Guam visitors brought their spouse, and only 15% were accompanied by their family. The median trip length for all visitors was 13 days. Significant data supports that the Pacific is not a single-destination travel market; and this portends well for selling Guam as a rest and recreation stopover. Consequently, this image should be reflected in Tumon Bay's planning and development objectives.

In analyzing this data the report recommends that, given a limited marketing budget by GVB for North American travelers, specific efforts should be made to attract the business traveler in this region and those who have friends or family on Guam.

Of all the attractions and activities which influence the destination decision-making by Pacific travelers, the most consistent attributes are historical/cultural attractions, outdoor recreation and natural scenery. The second-most often mentioned attribute is climate/weather. Therefore, considerations concerning the ocean, recreation, climate and friends or relatives all work in Guam's favor for attracting these visitors. Historical, cultural, scenery and sightseeing considerations are not strong points for Guam when compared to the overall Pacific market.

In determining the selective factors that are "extremely important" to the North American traveler in the Pacific, the responses in Table VII-3 were recorded.

TABLE VII - 3

IMPORTANCE OF FACTORS IN CHOOSING TRAVEL DESTINATION  
BY NORTH AMERICANS

|                                                  | Extremely Important<br>( in %) |
|--------------------------------------------------|--------------------------------|
| Friendly people                                  | 53                             |
| Safe place, low crime rate                       | 44                             |
| Sightseeing opportunities, good historical sites | 43                             |
| Good accommodations, first-class hotels          | 40                             |
| New culture, different people                    | 40                             |
| Good restaurants                                 | 39                             |
| Low cost, not expensive                          | 39                             |
| Good beaches and outdoor activities              | 38                             |
| Warm climate                                     | 36                             |
| Good shopping buys                               | 23                             |
| Ease of communication, no language barrier       | 17                             |
| Nightlife, lots to do after dark                 | 11                             |

The implication here is that Guam cannot be all things to all people, but it must project a threshold level of acceptability on such considerations as accommodations, cost, beaches, climate, culture, sightseeing and restaurants.

The greatest potential for increasing the number of visitors to Guam from this group comes from increasing its share of the stopover market. For this to be successful, however, the opinions of business travelers must be improved: 35% of them think of Guam as an unsuitable, single-location destination.

In summary, this report reiterates that while business travelers constitute Guam's regenerative visitor market, only limited gains can be expected from this group. Therefore, Guam must increase its attractiveness as a stopover market. Also, in addition to Guam selling its strong points, a minimum threshold, encompassing a broad range of factors, must also be available.

Attitudes expressed by North American visitors about their impressions of Guam were also canvassed. The positive impressions fell into four categories: attractions/activities (79%), ambience (59%), facilities/accommodations (38%) and climate/weather (37%). Guam's beaches are the positive factor mentioned most often in the attractions/activities category. Within the ambience category, Guam's friendly people received the largest number of favorable impressions, with the island's serene, quiet atmosphere as the second most popular asset. Thus, we find similarities with the images and positive attributes of Guam as expressed by Japanese visitors.

The summary of these attitude preferences is that Guam has two primary assets: its outdoor activities and its people. While these attributes are similar to other warm weather tourist destinations, the unspoiled, uncrowded, serene environment of Guam, coupled with standard Pacific resort accoutrements, give it a unique flavor. The final recommendation of this survey is that Guam must promote its overall image of beaches, friendly people and warm climate, all within a serene atmosphere. Here again, planning and development objectives for Tumon Bay surface from visitor preferences.

## B. ATTITUDES OF RESIDENTS ABOUT TOURISM AND TUMON BAY

During the summer months of 1980 the Department of Commerce conducted a survey among Guam residents entitled, "Guam Resident Attitude Survey on Tourism". This survey canvassed 5% of the households from all 19 villages to determine their attitudes about tourism and Guam's tourism industry. The survey concentrated on four areas: knowledgeability of tourism and the Guam Visitors Bureau; attitudes towards tourism in general; employment and training opportunities; and development.

The last section bears directly on Tumon Bay and provides guidance for the Master Plan in terms of planning and development objectives.

As a general location on Guam for tourist development, including hotels, most respondents (41.9%) preferred Merizo, with Tumon Bay (31.7%) as the second choice. The other locations in order of preference, are Inarajan (30.9%), Talofofo (27.7%), and Agat (12.7%). No opinion and other responses accounted for 28.3% of the respondents.

Cross-referencing by respondent's home village revealed that they generally preferred their own village over other locations. For example, 88.9% of Merizo residents preferred Merizo and 43.4% of Tamuning residents preferred Tumon.

From the viewpoint of the respondent's birthplace, Tumon was chosen by 27.8% of those born on Guam, 44.5% of those born in the Philippines and 21.8% of those born in the States. As a comparison, the majority of respondents born on Guam (43%) and the majority of respondents born in the States (41.4%) preferred Merizo.

The majority of native Filipinos (44.5%) chose Tumon, possibly because most Tumon hotel employees are from the Philippines.

Perhaps the survey question which is most relevant to the Master Plan seeks attitudes about hotel development in Tumon Bay. Here respondents were given a choice of preferences, and their responses are presented in Table VII-4.

TABLE VII - 4

### RESIDENT'S ATTITUDE TOWARDS TUMON BAY HOTEL REDEVELOPMENT

| Attitude                                                                         | Percent |
|----------------------------------------------------------------------------------|---------|
| It is already overdeveloped                                                      | 19.3    |
| It should remain as is                                                           | 27.0    |
| One or two hotels with a total of 200 to 800 rooms should be constructed         | 12.2    |
| Three or six more hotels with a total of 800 to 1200 rooms should be constructed | 6.7     |
| Tumon Bay should be intensely developed with high rise hotels and condominiums   | 14.4    |
| No opinion                                                                       | 16.4    |
| Unanswered                                                                       | 4.0     |

The conclusion here is that a majority (46.3%) of the respondents object to any additional development, while a significant proportion (33.3%) approve of a range from one or more hotels to intense development. These responses varied considerably from village to village; but, interestingly, only 40.3% of Tamuning residents feel that growth in Tumon should be frozen.

The birthplace cross-reference for these preferences about Tumon Bay development indicate that over half of the Guamanian (54.1%) and Stateside (52.1%) respondents believe that Tumon Bay is already overdeveloped or should remain as it is.

Insofar as the size of hotels in Tumon Bay is concerned, most respondents (28.2%) prefer a mixture of small, medium and large structures, as indicated by the results of Table VII-5.

TABLE VII - 5  
PREFERENCE FOR SIZE OF TUMON BAY HOTELS

| Preference                                                 | Percent |
|------------------------------------------------------------|---------|
| Small scale (Low-rise hotels of 1 to 3 stories)            | 10.9    |
| Medium scale (medium-rise hotels of 4 to 6 stories)        | 14.9    |
| Large scale (High-rise hotels of more than 6 stories)      | 18.9    |
| A combination of small, medium and large scale development | 28.2    |
| No opinion                                                 | 23.0    |
| None (no preference)                                       | .7      |
| No response                                                | 3.5     |

The relatively high proportion of "no opinion, no preference and no response" indicates that the issue of height and bulk of buildings may not have been familiar to the respondents. This is further confirmed with a cross-referencing by educational levels of the respondents. Nearly half (44%) of the "no opinion" respondents did not attend high school.

Further, Tumon Bay development will not apparently infringe on the family use of beaches. Respondents are almost equally split among those who foresee an increase, decrease, and no net change in beach use regardless of additional development. However, nearly half (49.7%) of the respondents now use Tumon Beach at least once per month. Clearly, additional development in Tumon Bay will not discourage family use of the beaches for either the infrequent or the frequent visitor.

Other relevant interpolations from this survey reveal that 44% of Tamuning respondents support tourism development in their village, but 30.3% do not. Tamuning respondents ranked only 15th among all 19 villages in support of such development in their home village. Village residents definitely (50.9%) want to tell hotel developers/ owners about the size and appearance of tourism facilities, with only 25.6% who would decline an opportunity for such involvement. Another 29.3% had no opinion or some other response.

## C. GOVERNMENT OF GUAM DEVELOPMENT OBJECTIVES FOR TUMON BAY

The Government of Guam has officially espoused development objections for Tumon Bay. These have occurred through both the Overall Economic Development Plan and certain legislation dealing with Tumon Bay.

### 1) Overall Economic Development Plan

For several years an Overall Economic Development Plan (OEDP) has been prepared by the Government of Guam to guide economic planning, decision-making and Capital Improvement Project selection. A major portion of each year's plan deals with tourism and, more specifically, Tumon Bay. Since the OEDP is the Government's only comprehensive mouthpiece for economic development programs, its objectives for Tumon Bay are distinctly relevant.

The OEDP adopted objectives for Tumon Bay are as follows.

Make Guam a desired and competitive destination area.

Provide for the diversification of Guam's tourist activities and facilities.

Upgrade and improve the facilities and services available to tourists on the island.

Develop tourist areas which are attractive in appearance, manageable and with recreational opportunities.

Protect and preserve shoreline areas and provide access to such areas for tourists and residents

Reconstruct, maintain and preserve sites which have been important in Guam's history.

Ensure that the growth of the visitor industry in Tumon Bay is consistent with the attainment of economic, social, physical and environmental objectives in the Territorial Comprehensive Development Plan. Such objectives include, but are not limited to, the striving for full and optimal employment and the attainment of a desirable rate of population growth.

Ensure that the visitor industry in Tumon continues to thrive and to assume a proportionate share of Guam's total tax burden recognizing, however, that an excessive tax burden on any industry can jeopardize or restrict the growth of that industry.

Encourage the public and private sectors to cooperatively maintain an economically viable tourism industry in keeping with the attainment of social, economic and environmental objectives.



## 2) Public Laws Dealing with Tumon Bay

Two recent Public Laws, P.L. 14-41 and P.L. 15-132 both state development objectives for Tumon Bay. Public Law 14-41, more commonly known as the "H" Resort-Hotel Zone Law, professes the purposes of a hotel-resort zone throughout Tumon Bay to "provide for high intensity development in a compatible arrangement of structures and uses in a unique setting."

Furthermore, the law envisions Tumon Bay as a zone that "shall be designed to promote a superior level of convenience, comfort and amenity within the zone; to encourage safe and pleasant pedestrian circulation; to preserve existing attractions; and to assure beneficial visual relationships from principal viewpoints." The Law goes on to state that "Development shall be designed to establish an open character, with higher portions of buildings well spaced and oriented with respect to principal views from within the zone. Pedestrian circulation systems shall form a convenient and coordinated network through buildings and landscaped open spaces, supplementing sidewalks along streets; and where extensive areas of the shoreline are in such configuration as to allow it conveniently, walkways and/or bikeways shall be provided along the waterfront on both public and private property."

Exemplary permitted uses in Tumon Bay were listed as cultural and recreational facilities, hotels, restaurants, tourism related shops and offices, dwellings, parks, marinas, zoos, amusement activities and supportive services. Permitted accessory uses and structures are those customarily accessory and clearly complementary to permitted principal uses and structures.

Public Law 15-132 authorized the Tumon Bay Master Plan project and provided for an appropriation to formulate the Plan. This Law called for short and long range plans for Tumon Bay development. It specifically addressed plans for such items as beach areas, picnic areas, recreational areas, shopping centers, car rental facilities, marine equipment rental facilities, aquarium, cultural centers, other tourism related facilities, highways, sidewalks, crosswalks and all other pertinent infrastructure improvements or additions conducive to the development of Tumon Bay.

### D. PLANNING AND DEVELOPMENT OBJECTIVES BY TUBAPAT

As described in Chapter VI, the Tumon Bay Planning Advisory Teams were instrumental in articulating many goals and objectives for the future development of Tumon Bay. Because these Advisory Teams were composed of every major public, quasi-public and private agency/organization associated with Tumon Bay, their collective insights offer valuable direction for the Master Plan.

In drawing on the overall input from TUBAPAT, several working principles of the TUBAPAT sessions must be understood. First, unanimous agreement among participants was never sought and, therefore, votes on issues were never taken. To the contrary, in fact, anything more than a consensus was virtually impossible to achieve for many of the development issues due to their opinionated nature. But despite the seemingly diabolically opposite opinions often expressed at the outset of some issue debates, a consensus was usually attained after an exchange of viewpoints and objectives.



Second, some agency representatives, especially from government, outnumbered others. Government of Guam agencies such as the Department of Commerce, for example, were necessarily represented by several staff members, because of the Department's multiple roles affecting the project such as: supervisory agency for the Tumon Bay Master Plan; overall economic development planning agency; tourism planning agency; and a member of the Guam Visitors Bureau Board of Directors.

Other agencies/organizations needed only one representative as spokesman due to their narrower involvement with Tumon Bay. Interests in this category included the Guam Environmental Protection Agency, Chamber of Commerce, Department of Parks and Recreation and U. S. Army Corps of Engineers.

From the outset of TUBAPAT, however, it was established that the number of representatives from any particular agency was not nearly as important as that of the effectiveness of its spokesperson in advocating the viewpoints and recommendations of that agency. In this regard, then, every participant was considered as an equal.

Third, the very nature of convening spokesmen from so many different interests for such a variety of issues demands some anonymity on the part of the participants. While they were each selected by their respective agency Director or organization President, the individual's personal experiences, and opinions often influenced their viewpoints as much as the mission or the purpose of their agency. This personal importance was anticipated early and influenced the selection of those invited to participate among representatives who were well versed in their technical field as well as intimately familiar with Guam and Tumon Bay.

Because of this individuality which emerged from many participants, it was decided to credit the final TUBAPAT recommendations to the group as a whole and thereby preserve the anonymity of the respective participants. Therefore, the following conclusions of TUBAPAT sessions are attributed to the total group context rather than to any agency or representative that may have participated.

In summary, TUBAPAT's envisioned a future Tumon Bay which generally:

- \* retained as much of the area's naturalness and vegetation as possible;
- \* had a specified limit of growth, beyond which no additional hotel development would be permitted;
- \* established distinct zones to accommodate resorts, hotels, tourist commercial activities, residential, and public open space; and
- \* permitted only minimum improvements to the lagoon.

Some of the more specific planning and development recommendations are listed below.

#### Land Use

Among the five recommended land use zones, the resort zones and hotel zones were generally earmarked for the oceanside of San Vitores Road with tourist commercial and residential developments on the cliffside. Three ecologically-

significant natural areas were to be preserved to the maximum extent possible. These are located at the peninsula north of Okura Hotel, the jungle area across from Bay View Apartments and the jungle area between the Pacific Islands Hotel and Beach Colony and the Guma Trankilidat housing site.

The cliffline was to receive special attention to protect its inherent beauty and character, although development could occur with special safeguards.

#### Lagoon Use

Of all the proposals advanced for the development of the Tumon Bay Lagoon, TUBAPAT resolved to recommend only minor alterations to the environment. These included some means of accommodating waders near the hotel beaches and one additional large, year-round swimming area near the San Vitores Beach area. In addition, some provisions for facilitating boat access to the ocean was approved, but without dredging of the channel or widening of the existing reef pass.

#### Development Density

TUBAPAT supported the establishment of a saturation development density beyond which point tourist industry development would be directed to other areas of Guam. A specific hotel room limit was endorsed, based on a predetermined density of development which would not jeopardize the project area's natural, open beauty.

#### Land Use Controls

TUBAPAT generally endorsed land use controls and growth management concepts which allowed for flexibility within established zones. The features of capital improvement programming, contract zoning, incentive zoning and regulations for Areas of Particular Concern (especially beaches, cliffs and ecologically significant areas) come closest to fulfilling the criteria acceptable to TUBAPAT's. The idea of tradeoffs and negotiations between the Territorial Planning Commission and prospective developers was accepted as a practical, growth-inducive means if implemented within an acceptable land use pattern in Tumon Bay. Incentives offered by the Government to achieve certain desired amenities by development plans are considered good business and conducive to economic growth within the area.

Public acquisition of lands, either in fee simple or to preserve certain areas in a natural state was not recommended because of the financial burden it would impose on the government's funds. Nor was the concept of development rights supported due to its rather sophisticated requirements and the possibility of landowner's hoarding their assigned development rights rather than selling or buying others to accommodate new growth.

#### Environmental Design Guidelines and Rules and Regulations for Zones

The promulgation of design guidelines for residential, resort, hotel and commercial buildings was enthusiastically supported by TUBAPAT and considered as one of the most valuable of all strategies to implement the Tumon Bay Master Plan. Such design guidelines should be separated from those hard and fast regulations for permitted uses, density, and bulk that must accompany each zone.

### Environmental Design Guidelines Advisory Committee

Some form of advisory committee to assist the Territorial Planning Commission in interpreting and applying the Environmental Design Guidelines was suggested. This committee's composition would include technical personnel from various development-oriented fields and function similarly to the existing Subdivision and Development Review Committee (SDRC).

The advisory committee would work exclusively with Tumon Bay developers within the bounds established by the Design Guidelines.

The authority to actually negotiate various tradeoffs between developer and the Government of Guam, however, would always rest with the Territorial Planning Commission.

### Financing

The Tourist Attraction Fund was overwhelmingly chosen as the prime source of funds for public Tumon Bay improvements. Upon reestablishing this Fund's integrity to its intended purpose of financing public recreation and tourism related projects, a portion of the fund should be pledged against a revenue bond, floated as soon as possible to pay for improvements in Tumon Bay which are consistent with the adopted Master Plan. Other portions of the fund should be committed to Tumon Bay for a maintenance program and for islandwide public recreation projects.

### Responsibility for Tumon Bay

Some agency or organization must be assigned with the authority and responsibility to implement the Tumon Bay Master Plan. This responsibility includes continued planning as well as undertaking the various strategies that are recommended to implement the Plan. Some candidates suggested are the Bureau of Planning, Guam Visitors Bureau, Guam Economic Development Authority, the Guam Hotel and Restaurant Association, a Tumon Bay Land Owners Association, and a Tumon Bay Development Authority. Reluctance to encourage a new Government agency or another level of bureaucracy was emphatically underscored.

### Tumon Bay Maintenance

The routine maintenance activities throughout Tumon Bay must be improved in order to display the intended image of the area. Rather than relying on the various Government of Guam agencies for providing these services, TUBAPAT recommended that this work be contracted to local, private firms and supervised by one government employee. This would take Tumon Bay maintenance needs out of competition with every other village and municipality and also relieve the Government of any demands now encountered for ever-increasing services. The Tourist Attraction Fund should be tapped to pay for this work.

Only routine maintenance and housekeeping chores would fall within this approach. Emergency repairs and ongoing expansions to infrastructure would remain under the cognizance of the respective utility agencies in the Government.

## E. FINAL PLANNING AND DEVELOPMENT OBJECTIVES FOR TUMON BAY

After synthesizing the various goals, objectives and recommendations discussed in previous portions of this Chapter, a final set of planning and development objectives can be discerned.

The following goal has been adopted to guide future planning, implementation and development. This overall goal is further supported by a series of more specific development objectives to guide, more articulately, both public and private development decisions for Tumon Bay.

The Government of Guam's goal for Tumon is....."to master plan Tumon Bay as a competitive Pacific Region tourist destination, as a medium and high density residential area and as a local, public recreation resource, through:

- o Providing incentives and support infrastructure for additional tourist industries investment.
- o Guiding this development with environmental design standards that augment Tumon Bay's natural amenities and enhance the quality of Tumon Bay's land and water resources.
- o Formulating a land use plan that accommodates resorts, hotels, tourist commercial, residential and public recreation uses.

This overall goal is further supported by a series of more specific development objectives to guide, more precisely, both public and private development for Tumon Bay.

- o Establish ultimate development densities for tourist accommodations.
- o Encourage only public recreation uses, resorts, hotels and tourist related industries in the area between San Vitores Road and the Tumon Bay lagoon.
- o Encourage only residential uses and tourist commercial facilities in the area between San Vitores Road and the cliffline, except for areas particularly conducive to resort development.
- o Develop a capital improvements program for support infrastructure to adequately serve existing and projected development.
- o Formulate a lagoon use plan to guide the use and development of the bay waters.
- o Protect and preserve shoreline areas and provide access to such areas for tourists and residents.
- o Reconstruct, maintain and preserve sites which have been important in Guam's history.
- o Prepare formal guidelines for the environmental design of Tumon Bay buildings and shoreline-oriented development, and adopt a procedure to implement these guidelines.

- o Preserve more shoreline and enhance the beach wherever possible for passive recreational pursuits by residents and tourists.
- o Ensure that the growth of the visitor industry in Tumon Bay is consistent with the attainment of economic, social, physical and environmental objectives in the Territorial Comprehensive Development Plan. Such objectives include, but are not limited to, the striving for full and optimal employment and the attainment of a desirable rate of population growth.
- o Ensure that the visitor industry in Tumon continues to thrive and to assure a proportionate share of Guam's total tax burden, recognizing that an excessive tax burden on any industry can jeopardize or restrict the growth of that industry.

## CHAPTER VIII

### THE TUMON BAY IMAGE

#### A. THE PREFERRED IMAGE

Guam's tourist industry is a vital but fragile component of Guam's economy. The Government exercises very little influence over the tourism market because it has no control over air routes, transportation costs and tourist's discretionary personal income and time for traveling. Guam's competitive edge for tourism is honed mainly through marketing its tropical beauty, hospitality and duty free shopping. These prime attractions, then, clearly summarize some goals for the Tumon Bay Master Plan.

For example, Guam must preserve those basic characteristics which attract the broadest possible spectrum of tourists. Ten years ago, Guam assumed a new role as a honeymoon destination, and nearly every tourist was a newlywed. But during 1980 the proportion of repeat tourists from Japan was 32%, and the proportion of all visitors making repeat trips to Guam was 44%. The inference is that the market is shifting, and Guam should be prepared for more shifting -- and even different kinds of shifts -- such as totally different markets and potential new tourists from within existing markets. It is very dangerous to cater to only one tourist market.

What Guam has that is not available in the home country of those now visiting or about to visit Guam is a clean, green, uncrowded tropical setting. It is imperative to preserve that "image" as Tumon Bay moves into the 1980's and 1990's. Translated into Master Plan language, therefore, Guam cannot risk the haphazard, incremental growth experienced so far (no matter how fortunate the outcome) for the next twenty years.

Therefore, this Master Plan must identify many areas for additional development, but only with strict guidelines and standards to control height, bulk, density and other structural characteristics that preserve view corridors, beach access and our tropical "image". The Government can afford to permit growth only without destruction of the area's inherent beauty and attractiveness. Under these guidelines, Tumon Bay will definitely not become wall to wall hotels, gift shops and condominiums, but instead it will retain an image of a verdant tropical setting, peaceful and quiet with lots of sunshine and seashore.

This image should not be confused with an uneventful, sedentary, low budget vacation for tourists. Guam has plenty of action to offer; but it will be offered, for the most part, outside of Tumon Bay. So long as the Tumon Bay area is maintained as an unspoiled environment it can always be assured of a market for competitive, first class accommodations. Those activities that generally conflict with the preferred Tumon Bay image -- water skiing, charter boat fishing, large scale camping and active sports -- can be provided at other places on Guam which are far better suited to such activities such as at Apra Harbor, Agana Boat Basin, Cocos Island and portions of Guam's interior.



## B. ULTIMATE DEVELOPMENT DENSITIES FOR TUMON BAY

Building on this "preferred image" as a premise, therefore, the Tumon Bay Master Plan intends to preserve an open, lush tropicana for tourists to spend their leisure time in the pursuit of suntans and sunset photos. As such, the Plan must propose an ultimate, ideal development density - a growth limit - beyond which the Government would induce new tourist development out of Tumon Bay and into other areas, such as Harmon Cliffline, East Agana Bay, Ylig Bay and Merizo, for example.

The "Tumon Bay Tourism Development Feasibility Study" evaluated, among other things, the infrastructure and physical resources of the Tumon Bay area. This report concluded that an additional 1,600 hotel rooms could be absorbed by the land area based on the "average" hotel that is now built in Tumon. This "average" hotel has 200 rooms and occupies eight acres of land. In effect then, an additional 1,600 hotel rooms would, more or less, achieve a balance of development between that witnessed in a few of the most dense neighborhoods, such as the Dai-Ichi/Fujita Hotel area, and that found in much less dense areas such as around the Hilton Hotel. Therefore, enough vacant land area now exists to accommodate at least 1,600 additional hotel rooms at a development density comparable to the average density of areas now developed in Tumon.

The analysis in Chapter IV, Visitor Arrivals and Accommodations, concluded with the forecast that by 1990 from 900 to 2600 additional rooms would be needed to accommodate a 5% and 10% visitor growth rate, respectively. This assessment of future needs was based on a 90% occupancy rate of hotel rooms and accounted for tourist accommodations throughout Guam, not only at Tumon Bay. Considering the size of investment required in the 1980's to construct new hotels, as high as \$200,000 per room in Hawaii, the lower estimate of 900 rooms is probably more realistic within the next ten years. (This argument is developed more fully in Chapter XVI, Financing Requirements and Investment Opportunities in Tumon Bay).

In summary, Tumon Bay now offers approximately 2000 hotel rooms and has the undeveloped land area for at least another 1600 based on prevailing densities of the developed areas. We can reasonably expect to need another 900 rooms by 1990. The new infrastructure required to support additional development has a lifetime of approximately 20 years; therefore, the year 2000 should be established as the planning horizon for the Government's investment to support a saturation development density. For the purposes of this Master Plan, therefore, the ultimate saturation development density of hotel rooms is targeted at an additional 2000 rooms; and supporting infrastructure is to be sized accordingly.

It's irrelevant whether more or less tourists arrive, but only that another 2000 rooms, developed within certain broad but effective environmental design guidelines, would fill-up the land area to a point within the definitions of the image that this Master Plan sets out to achieve.

Consistent with Tumon Bay Development Goals and Objectives in Chapter VII, the land area from San Vitores to the cliff is reserved for medium and high density residential use. Nearly 400 dwelling units now occupy this area. The residential development trend reflects apartments and condominiums; very few single family residences have been built in this area during the recent years.



Development in this location of Tumon Bay has been addressed only once previously, in the "Tumon Bay Tourism Development Feasibility Study". This report concluded that the area could support an additional 1,350 dwelling units based on physical resource requirements of the typical apartment/condominium complex now located there. This "typical apartment complex" contains 50 two-bedroom units and occupies 2 acres of land. The remaining Tumon Bay related reports and studies only imply that whatever development occurs between San Vitores and the cliff should not adversely affect the potential for tourism industry development throughout Tumon Bay.

Within the guidelines set for medium and high density zoning as well as for the scale and bulk of buildings, therefore, it is unnecessary to establish precise development densities except for determining infrastructure requirements. An additional 1,350 residential units is adopted as the ultimate development density for this portion of Tumon Bay.

## PART FOUR

### TUMON BAY DEVELOPMENT PLANS

Part Four encompasses the "plan" Chapters of this document. It presents the various land use, circulation, infrastructure and lagoon development elements of the total Master Plan. These elements reflect the planning and development objectives conceived in Part Three of the Master Plan.

## CHAPTER IX

### LAND USE

The development goals and objectives for Tumon Bay establish parameters for determining future desirable land uses throughout the area. Briefly, the goals call for a predominately hotel and tourist-oriented area, along with some residential and public recreation areas.

#### A. TUMON BAY LAND USES

The following land use categories are established to implement goals for the Master Plan. The land uses are portrayed on Plate IX - 1.

- Resort
- Tourist Commercial
- Residential
- Parks

The Resort, Tourist Commercial and Residential land uses shall constitute new Tumon Bay zones. The Parks category is reserved for Government land devoted to public park and recreation uses. The three new zones, together with their permitted uses, must be added to Title XVIII, Chapter III, Use Regulations of the Government Code of Guam. All applications for development must be brought before the Territorial Planning Commission for review.

#### 1. Tumon Bay Resort Zone

Tumon Bay Resort Zones are for tourist accommodations and tourist oriented businesses. Hotels in this zone are generally two to ten acres in size. The tourist oriented businesses are either within the hotel, appurtenant structures master planned as part of a hotel/resort project, or structures entirely unassociated with hotels. This one will accommodate both low and high density hotels, ranging in nature from the low profile, low density theme of the Pacific Islands Hotel and Beach Colony to the high rise, high density characteristics of the Guam Reef Hotel.

Because the location and density of hotel development within Tumon Bay significantly determines the overall image and character of the area, this Resort Zone must reflect the Plan's development objectives espoused in Part Three. Those objectives seek to maintain a predominately uncrowded setting, with emphasis on the lush tropical environment and spacious beaches. Earlier land use and zoning

alternatives favored two distinct zones for hotel and resort accommodations. The first would have been that reserved for typically low profile, low density projects of at least ten acres in size. That zone would have been assigned to larger, undeveloped tracts of land such as the Faifai and the Naton Beach areas and at the Pacific Islands Club/Pacific Islands Hotel and Beach Colony complex. The second zone would have been designated for high density development, such as medium- and high-rise hotels where the projects encompass approximately two to ten acres. This zone would have been typical of the development which now exists between the Dai-Ichi and the Fujita Hotels and at other sites such as the Guam Reef Hotel.

The high and low density zones were endorsed by TUBAPAT and others because they provided the greatest assurance of retaining Tumon's overall uncrowded image by virtue of the low density requirements of the one (low density) zone. However, this scheme fell into considerable disfavor with owners and developers of large properties whose land would have been restricted from higher development densities.

The one zone eventually recommended by this Master Plan for hotel and resort development, called the Tumon Bay Resort Zone, is a composite of the two original schemes and is portrayed at appropriate locations throughout Tumon Bay on Plate IX-1. While assiduous density control within the areas embraced by this zone is no longer possible, the overall maximum saturation density of no more than 2000 additional rooms in Tumon Bay is still intact by virtue of infrastructure (water and sewer) planning and design to serve the Tumon Bay Resort Zones.

Permitted uses of the Tumon Bay Resort Zone are as follows:

- a) Hotel buildings and hotel-condominiums containing 10 or more rooms intended or designed to be used, or which are used, rented or leased-out to be occupied, or which are occupied for sleeping purposes.
- b) Any retail business catering primarily to tourists, except those selling adult merchandise, including those which are: a) master planned in conjunction with a hotel; or b) within the hotel or hotel-condominium structure, including banking facilities, personal service shops, restaurants and cafes and establishments with or without license to sell alcoholic beverages; or c) unassociated with a hotel.
- c) Restaurants, cafes and establishments, with or without license to sell alcoholic beverages.
- d) Parking

## 2. Tumon Bay Tourist Commercial Zone

Tumon Bay Tourist Commercial Zones are for all non-hotel, retail businesses offering goods and services that primarily cater to tourists. Typical uses in this zone are gift shops, apparel, touring services, moped rental, etc.

Permitted uses of the Tumon Bay Resort Zone are as follows.

- a) Retail stores, shops and businesses catering primarily to tourist services.

- b) Amusement enterprises.
- c) Offices, business or professional, and banks.
- d) Personal service shops.
- e) Restaurants, cafes and establishments with or without license to sell alcoholic beverages.
- f) Adult merchandise shops.
- g) Parking.
- h) Other uses which in the judgment of the Commission, as evidenced by resolution in writing, are similar to or in support of those listed herein.
- i) Accessory structures for the above.

### 3. Tumon Bay Residential Zone

Tumon Bay Residential Zones are for sing-family, multi-family low density and apartment/condominium residential uses.

Permitted uses include the following.

- a) One-family dwellings.
- b) Duplexes
- c) Multi-family dwellings.
- d) Gardening and the keeping of pets for noncommercial purposes.
- e) Uses customarily accessory to any of the above uses including home occupations and private parking areas with accessory buildings and structures.
- f) Schools and churches.
- g) Parks, playgrounds and community centers.
- h) Health service offices, outpatient with laboratory.
- i) Utilities and public facilities.
- j) Accessory uses and structures for the above.
- k) Other uses which in the judgment of the Commission, as evidenced by resolution in writing, are similar to or in support of those listed herein.

### B. NON-CONFORMING USES

It is recognized that some investments in the form of design and construction plans have already been made in Tumon under the auspices of the existing "H" Hotel-

Resort Zone, and that these projects may not be completed before the Master Plan is formally adopted. Such proposed projects should be protected in accordance with the Master Plan's development objective to foster economic growth in Tumon. Some of the proposed developments are likely to be in conflict with the new zoning and land use regulations that will prevail after this Master Plan is in effect. Within reason, such non-conforming uses should be condoned and "grandfathered" into approval by the Territorial Planning Commission.

The following guidelines shall be used to determine whether a proposed project, conceived during the pre-Master Plan era and conforming to the "H" Resort-Hotel Zone, shall be granted approval (grandfathered) under this Master Plan's zone and regulations despite conflicts in land use or development standards. Grandfathered approval may be granted if the Territorial Planning Commission determines that:

1. The proposed project was conceived during the time that the "H" Resort-Hotel Zone was in effect; and
2. The project's design, plans and construction documents are complete within 60 calendar days of the formal adoption by Legislative Resolution of this Master Plan and such plans are submitted to the Territorial Planning Commission; and
3. That construction begins within one year after Master Plan adoption.

#### C. AREAS OF PARTICULAR CONCERN

Areas of Particular Concern (APC's) were first formally introduced as a land use designation in the 1978 Guam Comprehensive Development Plan, prepared by the Bureau of Planning. The purpose of designating APC's is to call attention to the importance of a particular type of area as well as to provide for an additional management capability that ensures responsible development in areas that have a high degree of environmental sensitivity or that are, or will be, subject to intense development pressures in the future. APC's have been designated to include unique terrestrial ecosystems, unique marine ecological communities, freshwater resources, industrial and commercial support areas, mineral deposits, shoreline development areas, air installation compatible use zones, slide- and erosion-prone zones, seismic fault zones, wetlands, flood hazard areas, mineral extraction sites, urban waterfronts, critical habitat, limestone forests and karst topography. Areas of Particular Concern, by their nature, occur throughout Guam's four general land use districts of Urban, Rural, Agriculture and Conservation. Each APC will eventually be controlled by a set of promulgated regulations or management measures administered by the appropriate government agency, usually the Territorial Planning Commission.

Areas of Particular Concern are, in more traditional land use lexicon, nothing more than overlay zones. An overlay zone is a mapped zone that imposes a set of requirements in addition to those of the "underlying" zone. In an area where an overlay zone is established, property is placed simultaneously in the two zones, and the land may be developed only under the conditions and requirements of both zones.

Overlay zones typically are applied when there is a special public interest in a geographic area that does not coincide with the underlying zone boundaries. Some of

the more common uses for such zones relate to special environmental features that restrain development. Other uses are to maintain the integrity of historic areas, to preserve views, to restrict areas to public uses, and to limit building heights in certain portions of a community.

Within Tumon Bay are two types of geographical areas which should be designated as new Areas of Particular Concern. They are "steep hillsides" and "areas of significant natural value."

Steep hillsides are valuable geographic features which guide community growth patterns and establish development parameters. They may serve as buffer strips, logical zone boundaries, and even opportunities for creative design and site planning techniques. Steep hillsides possess a character of public resources, much as do wetlands, seashores, critical habitats and other similar areas of particular concern.

The designation of steep hillsides as APC's and the promulgation of appropriate development guidelines will help to assure that these geographical features are developed with sensitivity and forethought. The steep hillside which meanders through Tumon Bay is exemplary in the effect that such features can impose on an area's growth pattern.

Relegating the Tumon hillsides to only the zoning regulations is insufficient to protect their inherent value. As APC's however, special regulations (not restrictions) can be imposed on development plans affecting hillsides. These guidelines would overlay the proposed land use zones from the toe to the top of the hillsides. The general intent of the APC steep hillside regulation would be to minimize the destructive effect of constructing facilities in the residential, tourist commercial and resort zones where they interface with the Tumon Bay hillside.

Areas of Significant Natural Value, while more subjective than steep hillside because of their amorphous nature, should also be considered as a new Area of Particular Concern. Areas of Significant Natural Value pertain to those tracts of land which possess:

- \* a strategic location of transition between two very different land use patterns; or
- \* a particularly desirable development density (either low or high) which contributes to the surrounding areas' planned growth.

Three such areas exist in Tumon Bay. They are the peninsula north of the Okura Hotel, the jungle area fronting the inland side of San Vitores Road between the proposed resort, residential and tourist commercial area and the buffer strip separating Guam Trankilidat and the resort zone to the southwest. These three sites, also depicted on Plate IX-1, all possess significant natural value and lend considerable beauty and tropical verdure to the Tumon Bay area.

Designating these sites, or others around Guam which may also qualify as future areas of particular concern must not be confused with preserving them in their current state. That could only be accomplished through condemnation and fee simple acquisition, a program which the Government of Guam cannot afford. At

best, development regulations for such APC's can be a guarantee to retain as much of the area's significant natural value as possible when development plans are inevitably submitted to the Territorial Planning Commission.

Until such time as Tumon Bay Steep Hillsides and Tumon Bay Areas of Significant Natural Value are formally designated as APC's and appropriate regulations promulgated to protect their inherent values, this Master Plan recommends that environmental design guidelines, presented in Appendix C, be applied to planning and design decisions for projects located in these two types of areas.

#### D. TUMON BAY LAND USE DESIGNATIONS

Plate IX - 1 presents the proposed Tumon Bay Land Use Plan utilizing the land uses described in the previous sections.



## CHAPTER X

### CIRCULATION AND PARKING

#### A. SAN VITORES BOULEVARD

The existing San Vitores Road is the common link among residential, tourist industry and public uses throughout Tumon Bay. As the major transportation corridor separating both hotel and village development, its design sets a predominant theme and focal point for the whole area.

The present two lane facility provides sufficient carrying capacity for the projected average daily traffic (ADT). The 1980 ADT was determined by the Department of Public Works as 10,100; 10,400; and 10,600 at the western, middle and eastern sections of San Vitores, respectively, with a 2% increase per year anticipated. At this rate the carrying capacity will be adequate until approximately 1990. Other existing features of San Vitores Road are not adequate, however. They include two accident-prone intersections, one dangerous curve and numerous exposed manhole covers and lateral depressions which significantly detract from a safe riding surface of the roadway.

Each of these problems can be isolated, redesigned and improved incrementally without overall reconstruction of the road. Only in combination with other essential infrastructure improvements in the same right-of-way, notably sewer and water system upgrading, does substantial reconstruction and widening of San Vitores Road into a Boulevard become practical.

The predominance of San Vitores Road imposed by its spine-positioned corridor through Tumon Bay significantly influences the general land use concepts of the project area. The corridor serves both the local and through-traffic link as well as the area's only improved circulation for pedestrians, bicycles and mopeds. Furthermore, it serves as the link among the project area's major land use categories of resort, tourist commercial and residential. Consequently, the conceptual design of San Vitores Road is an important factor to the effectiveness of the Tumon Bay Master Plan.

Ideally, the San Vitores Boulevard conceptual design should achieve these objectives.

- (1) Provide a safe, congestion-free traffic arterial through Tumon Bay.
- (2) Allow for restricted left-turn movements.
- (3) Provide for a combined pedestrian/bicycle pathway to accommodate safe circulation for tourists throughout Tumon Bay.
- (4) Effect a transition zone between the different land uses which occupy opposing sides of the Boulevard.
- (5) Portray a pleasant, appealing environment, reflective of a first-class tourist attraction, for both vehicular and pedestrian traffic.

# 1) Proposed Conceptual Design

Initial planning calls for a 22-foot wide pavement section on each side of a center median. In general, the "Boulevard's" median will be 16-feet wide, although it will vary somewhat throughout the length of the road in response to actual conditions. The Boulevard establishes a softer image than the existing road and will provide an overall structure running the length of the corridor. It will control crossing traffic and will provide a left turn shelter lane at designated intersections. The center boulevard will allow for separation in grade of adjacent roadway sections in areas where steep terrain on each side of the road makes a level road impractical. It will also provide a center planting area for larger trees, free from overhead obstructions.

The cross-section will provide a 22-foot paved roadway in each direction consisting of a 12-foot travel lane, an 8-foot shoulder and a 2-foot curb-and-gutter. The total curb to curb width, including the center median, is therefore 60 feet. The 8-foot shoulder will be utilized for parallel parking and for shuttle bus pull-off at designated points. Plate X-1 presents the plan view of the proposed conceptual design of San Vitores Boulevard. The paved travelways should be aligned in a slightly serpentine fashion within the existing right-of-way in order to reduce the tendency for speeding.

Should it become necessary, this configuration will accommodate future traffic increases through conversion of the 22-foot wide sections to two 11-foot travel lanes.

This roadway plan will commence at the top of the hill at Chalan San Antonio and continue to the Guam Okura Hotel. Within this length, two differing right-of-way width conditions occur. The right-of-way from Chalan San Antonio to the Tumon Loop Road in the area of Guma Trankilidat is 78 feet in width, see Plate X-2. From this point to the Okura Hotel, the right-of-way is 100 feet in width, see Plate X-3. The variation in this right-of-way will be absorbed in the width of the adjacent pedestrian and buffer landscaping areas. There is no requirement for acquisition of additional right-of-way anticipated.

Those portions of San Vitores Road and Tumon Loop Road up the hill to Marine Drive at the Australian Cable Station and at JFK High School will incorporate an additional 11-foot climbing lane for uphill traffic, see Plate X-4. These areas will additionally be paved with open-graded or other non-skid type of paving. Less steep sections can be accommodated with a grade separation, as shown in Plate X-5.

Equally important in the design of the Boulevard are the pedestrian circulation and other public amenities. A combined walkway/bikeway will occur along the ocean side of the roadway from end to end. The primary advantages of the walkway/bikeway is its ability to adapt to changing right-of-way conditions and to existing features and activities. Additionally, it prevents the break-up of the roadside area into a series of narrow walks and bike trails separated by small planting strips which would be difficult to maintain and confusing to those who use them. Instead, the 10-foot wide walkway/bikeway is intended to meander through a 15-foot to 20-foot landscaped corridor in an informal manner responsive to local conditions. This scheme is also shown in Plate X-1.

In those areas where a 100-foot right-of-way is available, a 5-foot walkway will also be provided on the inland side of the road. This walkway will serve the tourist commercial and residential land uses planned for that side of the roadway. An additional 12-foot buffer will separate this walkway from the property line to increase the apparent setback of adjacent development. The buffer will be available for landscaping and pedestrian related improvements by adjacent developers under a use permit.

Within the narrow 78-foot right-of-way section, no walkway or buffer will be provided on the inland side of the roadway. The adjacent land use is primarily low density residential, and the steeply sloping topography precludes the practical development of a walkway. Should a sidewalk be desired by adjacent property owners, it may be constructed within their property.

On both sides of the road, a planting/utility strip will be provided to insulate the walkways from the roadway. Bollards, planting and other devices will be utilized to prevent vehicular traffic from encroaching on the pathways.

Certain functional elements and amenities will occur along the Boulevard in support of the pedestrian activity.

- a. Shuttle bus pull-offs. Eight pick-up points occurring near major hotel, housing and recreational areas are anticipated. These pull-offs will occur at 1400-foot to 2200-foot intervals. Public shelters located at the pull-offs will incorporate protected waiting areas, location maps, telephone, vending machines and bicycle parking.
- b. Street furniture, benches and trash containers will occur at each shelter and at approximately 400-foot (about one city block) intervals.
- c. Drinking fountains will occur at each shelter and at approximately 800-foot intervals.
- d. Loops to the beach will intersect with the Boulevard at major beach recreational areas and hotel/resort locations. Conceptually, this network will be integrated into a beachwalk which follows the shoreline through the length of Tumon Bay.
- e. Interpretative archaeological and other displays may occur at the major beach access points, i. e., Ypao, Matapang and San Vitores Beaches.

Lighting will be concentrated on the walkways as that is where the lighting is most needed. Lighting will frame the roadway with higher levels occurring at intersections and crosswalks. In general, the roadway itself will be softly lighted; and landscape lighting will be provided to define the center median.

The walkways will be lighted to a uniform level of approximately 1-2 foot candles to assure safety and security of pedestrians. Lighting standards will occur approximately every 60 to 75 feet, but not to exceed 5 times the mounting height. To maintain an unobtrusive human scale, light standards should not exceed 15 feet in height.

Cross-walks should also be defined by a change in texture or other physical methods for increasing driver awareness of pedestrian activity.

Finally, the generous use of landscaping will be utilized to secure the resort image desired for Tumon Bay. Landscaping will become a major visual element of the roadway and will complement and integrate adjacent developments. The center median with its overhanging canopy trees will provide a dominant visual image.

An intermix of tree types and sizes and complementary low vegetation will help to stress the visual character of the resort setting. Low plants and shrubs will sustain the desired green environment during the period for growth and maturity of the large tree specimens and will shield opposing traffic from headlight glare.

Continuous landscaping on both sides of the Boulevard will be an essential element of the walkway design. At the inland side adjacent property owners will be asked to share in the development costs by providing landscaping and plaza development within the 12-foot buffer. This will provide the opportunity to announce the presence of their development through higher visual activity, wider sidewalks, formal landscaping, outdoor rest areas, street furniture and other features which will stimulate awareness of adjoining buildings and activities.

Those roadway segments associated with major scenic features will utilize a landscaping treatment that retains and frames the major views from the Boulevard. Adjoining structures must also be sited and designed so as to not diminish the scenic quality of the Boulevard or interfere with important views.

As a means of identifying and stressing the conceptual importance of the Tumon Bay resort area, major entry points should be emphasized with dominant grouping of landscaping and possibly some type of a sign. Tall trees such as coconut palms or royal palms create this strong gateway image without obstructing the magnificent vista of Tumon Bay as seen from the hilltop entry points.

## 2) Utility Corridor

Because of its strategically central location in the project area, the San Vitores Boulevard right-of-way must necessarily function as a major utility corridor in addition to the traffic artery it is envisioned to be. Primary elements of the utility infrastructure including power, water, sewer and storm drainage facilities will be routed through the corridors in such a configuration as to a) avoid conflicts between utilities; b) provide optional service to tributary components and areas; and c) allow utility service to continue while improvements are under construction.

## B. PARKING PLAN

The parking plan for Tumon Bay is comprised of three components.

- \* Private off-street parking, provided as a part of a development project to meet the vehicle parking requirements generated by that project.
- \* Public on-street parking, provided as an element of the roadway construction or improvement and intended for non-specific public use.
- \* Public off-street parking. Public parking areas located at major beaches, recreation areas and related community facilities. This component also includes a set-aside of parking spaces in conjunction with a development project for dual private and public usage. This occurs most typically in areas with access to the shoreline and beach as a means of providing parking for recreational purposes.

For purposes of this study, most emphasis is placed on establishing standards for parking in conjunction with private developments. Public parking areas presently exist only at Ypao Beach.

Parking regulations are included as a part of the Tumon Bay Zone Rules and Regulations for development in the Tumon Bay resort area (Appendix B). A graph is provided therein to delineate the scope of parking required for each type and size of project. The graph is to be used by applicants to indicate clearly the requirement, and it eliminates the need for bulky computations which are often overlooked or inaccurately performed. The graph is calculated approximately on formulas as follows:

1. Tourist Commercial - Off-street parking shall be provided at a ratio of five parking spaces for each 1,000 net square feet (NSF) of floor area up to 5,000 NSF. Above 5,000 NSF, parking shall be provided at a ratio of three spaces per 1,000 NSF. This overall ratio includes an allowance for employee parking.
2. Resort Development - Off-street parking is predicated on the existing code. This requires a ratio of one space for each four hotel units plus parking for employees at a ratio of three spaces for each four employees. For simplicity, the graph represents an overall ratio of one space for each three hotel units (1:3) which includes employee parking requirements. Those portions of the project which are used exclusively as tourist-commercial must meet the requirements of tourist-commercial developments, above. Public-use space such as meeting rooms, banquet rooms and convention facilities must provide parking at a ratio of one space for each 100 square feet of space. Bus parking shall be provided at a ratio of one bus parking space for each twenty automobile spaces in this zone.
3. Residential development - The current requirement for residential parking of one space per dwelling unit has proven to be grossly inadequate in this day of multicar families. Until the establishment of a mass transit system, it is doubtful if the "one-man-one-car" situation will change appreciably. This is especially relevant for housing constructed in Tumon Bay which is expected to be directed toward a more affluent section of society because of high land prices. As such, a higher ratio of car ownership should be expected than might be found in other sections of the community. Under this plan, an overall ratio of two cars per dwelling unit is provided for. This includes any minor requirement for employees parking. For projects where on-street parking is available at the curb adjacent to the development, this parking will help to satisfy the overall requirement, but not to exceed 15% of the total requirement.

The above off-street parking summary is intended as the minimum parking allowance for a development. The Territorial Planning Commission may increase this parking requirement to provide for non-typical circumstances and activities.

For other usages and activities such as those with a small ratio of building area to user population or employees (such as those utilizing extensive open space, or outdoor areas, amusement and recreation associated facilities), the total parking requirement must be established by the Territorial Planning Commission based on the projected use and vehicle load forecasts.



Finally, for all off-street parking provided in conjunction with a project development, it is desirable to set aside a proportion of parking spaces for the use of the general public while visiting the Tumon Bay area. In other words, residents who wish to use the beach, stroll the walkway, or window-shop should have parking available for their use. The Boulevard curbside parking will provide a portion of this, but to insure adequate parking for the resident public, each project is required to designate ten percent of their parking for use of the public. This is intended as dual-usage and not exclusive usage. The parking will be available for use by customers and employees, but cannot be reserved exclusively for their use or denied for public use. This is especially relevant for projects located along the shoreline and adjacent to beach access points. At these locations, the dual-use parking should be that parking located most convenient to the beach or beach access point. In this manner, it is felt that the developer will be able to assist in meeting the overall public parking requirement without the expenditure of additional construction costs for parking for the exclusive use of the public. Additionally, in most cases it is anticipated that public use will occur on weekends and evenings, when the use of parking for employee or business purposes is decreased.

### C. INTERIOR TRAFFIC CIRCULATION AND UTILITY NETWORK

An interior traffic circulation and utility right-of-way network must be established to support and promote orderly development of areas designated for tourist commercial and village residential use. While there is presently an apparent framework of access and utility corridors totalling over 3 miles in length, the configuration is not entirely satisfactory because existing roads, some paved, generally branch eastward from San Vitores Road and terminate at the base of the cliff. Fortunately, Duggan's Gulch road continues up the slope and intersects Route 1 thus creating an important third access from the project area to Marine Drive. Plate X-6 illustrates the existing road network, among other things, in the Tumon Village area.

In order to develop an acceptable right-of-way network, existing roads must be ascertained as legal public right-of-ways, or re-established as such, then interconnected by new corridors which result in the formation of a grid. However, achieving this objective will be expensive since some existing roads are not located on public rights-of-way, and land for connecting right-of-way corridors must be carved from private properties.

Interior traffic circulation and utility right-of-way corridors need only be wide enough to accommodate two travel lanes as well as secondary power, communication, sewer, water and storm drainage facilities. Oversized corridors are not warranted in an area where land values are at a premium, such as in Tumon. Accordingly, corridor widths need not be greater than 44 feet, but shall not be less than 30 feet. An intermediate right-of-way corridor width of 40 feet is recommended for residential zones, while the maximum corridor width of 44 feet is recommended for tourist commercial zones.

#### 1) Corridor Improvement Schemes

Four types of corridor improvements are possible, categorized as Type 1 through 4. Type 1 requires the least improvements and Type 4 requires the most improvements.

The following, in conjunction with Plates X-6 through X-10, describes the recommended types of improvements in detail.

2) RESIDENTIAL (30-foot to 40-foot ROW)

Semi-Urban (Minimum Improvements) - Type 1 Improvements

- 20-foot wide A.C. paved travel way
- Surface drainage facilities (ditches and swales)
- Public sewage collection system
- Overhead power and communication facilities
- Water distribution lines/fire protection appurtenances

Urban (30 or 40-foot ROW) - Type 2 or 3 Improvements

- 20-foot to 28-foot wide (depending on ROW width) AC paved curbed travel way
- 4 to 6-foot wide sidewalks with spot planters.
- Underground drainage facilities
- Public sewage collection system
- Water distribution lines/fire protection appurtenances
- Underground power and communication facilities.

3) TOURIST COMMERCIAL (44-foot ROW)

Semi-Urban - Type 1 Improvements

- 20-foot wide A. C. paved travel way
- Surface drainage facilities (ditches and swales)
- Public sewage collection system
- Overhead power and communication facilities
- Water distribution lines/fire protection appurtenances

Urban - Type 4 Improvements

- 30-foot wide A. C. paved curbed travel way
- 7-foot wide sidewalk with spot planters
- Underground drainage facilities
- Public sewage collection system
- Water distribution lines/fire protection appurtenances
- Underground power and communication facilities

The construction of various segments of the road network may be accomplished by either, or through, a combination of the following ways.

- \* Improvement District Program
- \* Government-funded village streets construction/reconstruction program
- \* By a subdivider as part of the requirements of the Subdivision Law
- \* By a private developer (with the intent of dedicating completed improvements to the Government).



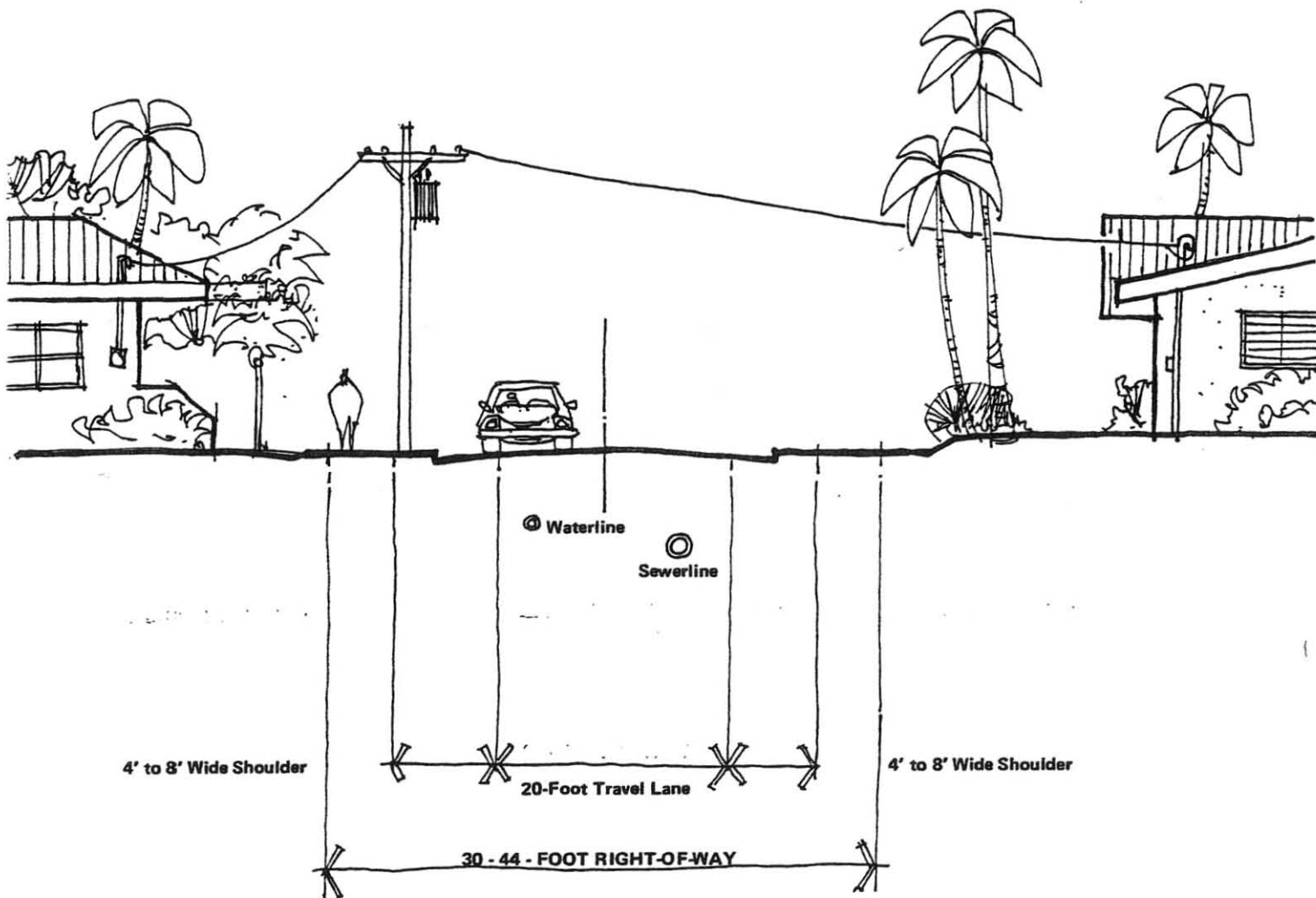


PLATE X - 7

TYPE 1

SEMI-URBAN RESIDENTIAL/TOURIST COMMERCIAL  
MINIMUM IMPROVEMENTS

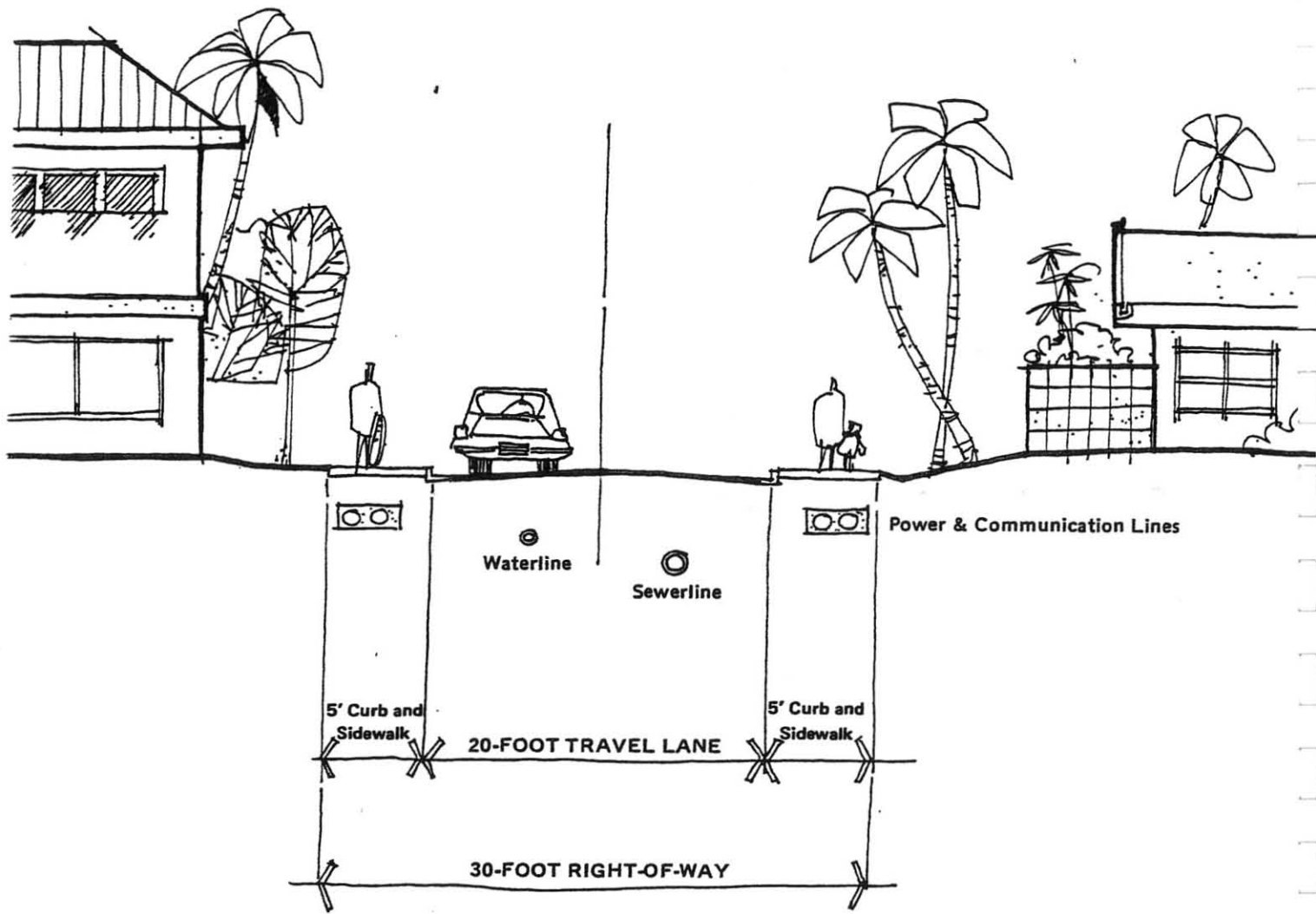


PLATE X-8  
TYPE 2  
URBAN RESIDENTIAL - 30-FOOT ROW

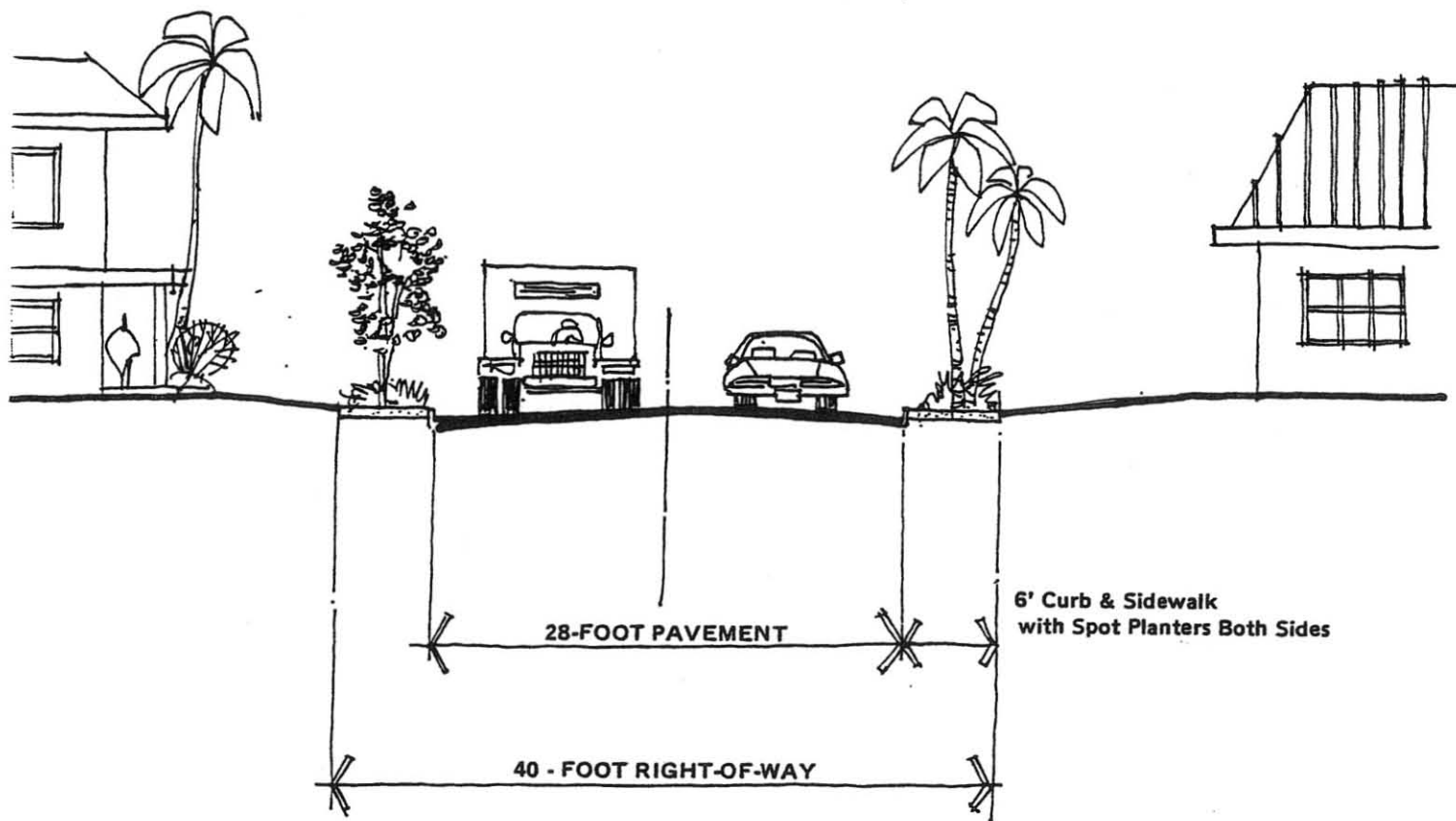


PLATE X-9  
TYPE 3  
URBAN RESIDENTIAL - 40-FOOT RIGHT-OF-WAY

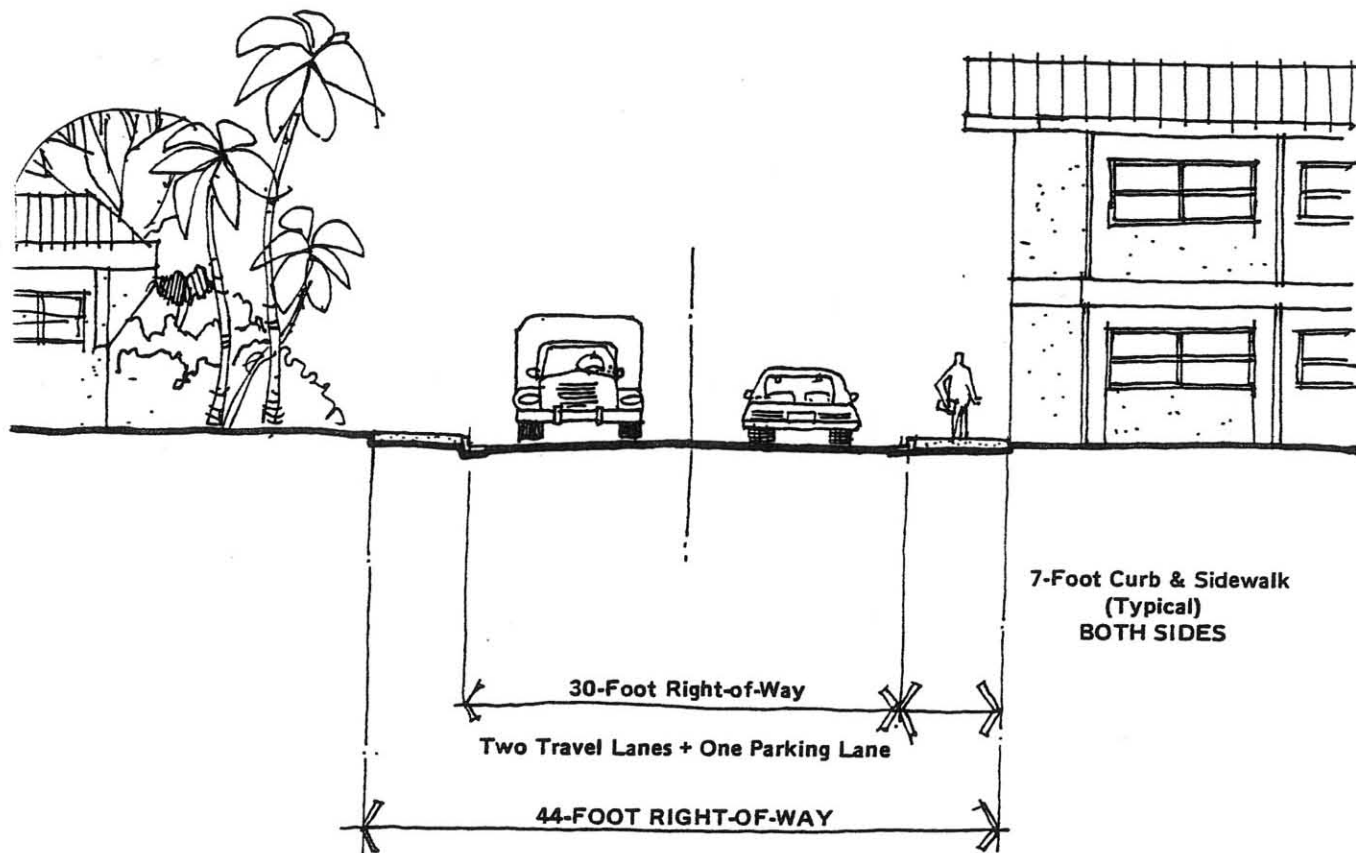


PLATE X - 10

TYPE 4

URBAN TOURIST COMMERCIAL

However, before road improvements are constructed, utility infrastructure such as sewage collection, water distribution, storm drainage, power and communication system facilities must be logically in-place to avoid the expensive, yet oft-recurring situation of trenching newly paved streets to place utility lines. Therefore, it is essential that the design and construction of principal elements of access and utility infrastructure be carefully coordinated and sequenced to assure overall economy of effort. Furthermore, to guide implementation of the plan, corridor development must be prioritized. Segments of the network having a legal basis for existence and/or play a critical role in the function of the circulation network must be given primary consideration for development. For example, Duggan's Gulch Road which serves as a major north-south component of the network, contains main sewer and water lines and links Route 1 to San Vitores road, and it must be ranked higher priority when programming infrastructure improvements. Plate X-1 also ranks groupings of segments of the network in order of priority for development.

#### D. COST OF CONSTRUCTION

Table X-1 itemizes the respective level of improvements and cost per linear foot for each type of corridor. Table X-2 summarizes the construction cost of each corridor according to a prioritized development sequence. Table X-3 summarizes the cost of interior road development by recommended priority.

TABLE X-1

CONSTRUCTION COST  
INTERIOR CIRCULATION ROADS

| ROAD TYPE                     | TYPE | ROW WIDTH<br>(Feet) | COST PER FOOT | LEVEL OF IMPROVEMENTS                                                                                            |
|-------------------------------|------|---------------------|---------------|------------------------------------------------------------------------------------------------------------------|
| Semi-Urban Residential        | 1    | 30-40               | \$ 62         | 20-Foot A. C. paved (2" thick) travel way, 4-foot shoulders, surface drainage                                    |
| Urban Residential             | 2    | 30                  | \$ 115        | 22-Foot A. C. paved travel way, 4-foot sidewalk (both sides) and underground drainage system.                    |
|                               | 3    | 40                  | \$ 130        | 28-Foot A. C. paved, curbed travel way 6-foot sidewalks (both sides) w/Planters and underground drainage system. |
| Semi-Urban Tourist Commercial | 1    | 44                  | \$ 75         | 20-Foot A. C. paved travel way, 8-foot shoulders, surface drainage                                               |
| Urban Tourist Commercial      | 4    | 44                  | \$ 150        | 30-Foot A. C. paved travel way, 7-foot sidewalks (both sides) w/planters and underground drainage system.        |

TABLE X-2

## TUMON VILLAGE ROAD NETWORK

CONSTRUCTION COST ESTIMATE<sup>1/</sup>

| CORRIDOR           | PRIORITY | LENGTH<br>(Linear Feet) | ROW<br>WIDTH<br>(Linear Feet) | COST OF IMPROVEMENTS BY TYPE |           |            |            |
|--------------------|----------|-------------------------|-------------------------------|------------------------------|-----------|------------|------------|
|                    |          |                         |                               | 1                            | 2         | 3          | 4          |
| Residential        | 1        | 5630                    | 30 or 40                      | \$ 349,060                   | \$647,450 | \$731,900  | N/A        |
| Tourist Commercial | 1        | 3,500                   | 44                            | \$ 262,500                   | N/A       | N/A        | \$ 525,000 |
| Residential        | 2        | 3,430                   | 30 or 40                      | \$212,660                    | \$394,450 | \$445,900  | N/A        |
| Tourist Commercial | 2        | 5,610                   | 44                            | \$420,750                    | N/A       | N/A        | \$ 841,500 |
| Residential        | 3        | 980                     | 30 or 40                      | \$ 60,760                    | \$112,700 | \$ 127,400 | N/A        |
| Tourist Commercial | 3        | 2,560                   | 44                            | \$ 192,000                   | N/A       | N/A        | \$ 384,000 |

NOTE: 1. This Table should be used in conjunction with Table X-1 and Plate X-6.



TABLE X-3

## ROAD CONSTRUCTION COST BUDGET\*

| PRIORITY 1                                                |              | PRIORITY 2                                                |             | PRIORITY 3                                                |            |
|-----------------------------------------------------------|--------------|-----------------------------------------------------------|-------------|-----------------------------------------------------------|------------|
| Minimum Improvements<br>(Based on Minimum<br>ROW Widths)  | \$ 611,560   | Minimum Improvements<br>(Based on Minimum<br>ROW Widths)  | \$ 633,410  | Minimum Improvements<br>(Based on Minimum<br>ROW Widths)  | \$ 252,760 |
| Ultimate Improvements<br>(Based on Maximum<br>ROW Widths) | \$ 1,256,900 | Ultimate Improvements<br>(Based on Maximum<br>ROW Widths) | \$1,287,400 | Ultimate Improvements<br>(Based on Maximum<br>ROW Widths) | \$ 511,400 |

NOTE: \*Add 20% for Engineering and Administration fees to construction cost for total project cost.

## CHAPTER XI

### WATER, SEWER AND STORM DRAINAGE

Water, sewer and storm drainage improvements are critical prerequisites to achieving Tumon Bay's development objectives. All three infrastructure systems are now inadequate to accommodate existing facilities in Tumon Bay, much less new growth. This chapter presents improvement plans to upgrade the system in order to accommodate the proposed land use and saturation density of Tumon Bay.

Of course, before water, sewer and storm drainage improvement plans can be prepared, the existing system and deficiencies must be evaluated to determine deficiencies. This task was performed in conjunction with a technical request entitled, "Tumon Bay Tourism Development Feasibility Study" prepared in June 1980 for the Department of Commerce. The Report analyzed demand vs. capacity for Tumon Bay's water, sanitary sewer, power and telephone systems. Other development features were also analyzed. They included zoning, vehicular circulation, storm drainage, beach areas and solid waste management.

The data and statistics contained in the Study are relevant to understanding the basis for design and evaluation of demand vs. capacity for each system. Therefore, the Study is included in its entirety as Appendix A as a reference to the reader.

#### A. WATER SYSTEM

The adequacy of the water supply and transmission system serving Tumon is one of the most critical factors influencing the implementation of the Plan. Simply, the lack of water means no development, and an inadequate supply will inhibit growth in a directly proportional relationship. Fortunately, the project area is reasonably close to an abundant water supply, the northern water wells and storage facilities. This source is adequate to support growth in Tumon far in excess of that envisioned by the Plan. Adequate storage and transmission facilities are in-place. However, the water transmission and distribution system serving the project area is deficient in many ways. These inadequacies create problems for existing development and, as discussed in the Tumon Bay Tourism Development Feasibility Study (Appendix A), the existing system cannot fulfill the water requirements of a growing Tumon Bay.

The deficiencies of the existing water system serving the project area merit a brief summation to establish the basis from which recommendations for system improvements will be made.

- (1) The water distribution mains in the project area are, generally speaking, under-sized and fail on occasion to deliver adequate flow to meet peak demand.
- (2) The configuration of the water supply network serving the project area is hydraulically inefficient and does not provide for sufficient storage to meet Tumon's daily consumption and fire fighting requirements.
- (3) Only 22 out of 120 required fire hydrants are available to provide adequate fire-fighting capability in Tumon, and many existing hydrants are connected to 4-inch diameter mains, a situation which diminishes the usefulness of existing firefighting facilities.

- (4) Existing pressure regulating facilities on San Vitores and Tumon Road now malfunction.

Not only must the existing system be upgraded to meet current consumption and fire fighting requirements, but significant improvements must also be made to the water infrastructure to provide for the water use requirements of the Plan. In fact, the objective of the planning and design of the utility infrastructure network is to provide for and promote the implementation of the Plan.

The basis for design of water system improvements will be guided by the following.

- \* Water system design criteria set forth in the Water Facilities Plan.
- \* Water demand for the ultimate tourist population predicted by the Master Plan.
- \* The configuration of the Land Use element of the Plan and location of utility corridors.
- \* The adequacy and availability of existing water supply, transmission and distribution facilities.

1) Water System Design Criteria

The Water Facilities Plan cites the criteria and standards for use in the planning and design of water systems on Guam. The following are determined to be applicable to the project areas.

|                                 |   |                            |
|---------------------------------|---|----------------------------|
| *Average Daily Consumption Rate | - | 145 gpcd                   |
| * Maximum Daily Demand          | - | 1.5 x Average Daily Demand |
| * Fire Flow                     | - | 3,700 gpm for 3 hours      |
| * System Pressure               | - | 40-80 psi                  |
| * Pipeline Capacity             | - | Maximum day and fire flow  |
| * Distribution Storage          | - | Maximum day demand         |

Since the water demand in the project area is a function of the resident as well as the tourist population, a separate criterion for the average daily water consumption rate for tourists must be established. Therefore, for purposes of estimating water demand, tourists will be assigned an average daily water consumption rate of 116 gpcd or 80% of the average daily consumption rate of 145 gpcd for the resident population.

- 2) The average daily water demand for the project area by service zone (see Sheet 3 of Appendix A) based upon the Plan's estimated ultimate resident and tourist population is presented in Table XI-1. The maximum daily water demand plus fire flow, the criteria used for sizing transmission lines, is presented in Table XI - 2. From this Table it is concluded that the water supply and transmission network serving the project area must be capable of summarily delivering 5.54 million gallons per day. In order for this to be realized, water facilities within the project area must be well integrated and looped to assure uniformity of flows and pressures.

TABLE XI-1

## WATER CONSUMPTION BY SERVICE ZONE

| ZONE* | RESIDENTS | X | 145 | + | TOURISTS | X | 116 | = | GALLONS PER DAY |
|-------|-----------|---|-----|---|----------|---|-----|---|-----------------|
| A     | 840       | X | 145 | + | 1779     | X | 116 | = | 328,164         |
| B     | 100       | X | 145 | + | 546      | X | 116 | = | 77,836          |
| C     | 711       | X | 145 | + | 2040     | X | 116 | = | 339,735         |
| D     | 160       | X | 145 | + | 2250     | X | 116 | = | 284,200         |
| E     | 48        | X | 145 | + | 2028     | X | 116 | = | 242,208         |
| F     | 600       | X | 145 | + | 1050     | X | 116 | = | 169,128         |
| G     | 2345      | X | 145 | + | 708      | X | 116 | = | 422,153         |
| H     | 1394      | X | 145 | + | 600      | X | 116 | = | 271,730         |
| TOTAL |           |   |     |   |          |   |     |   | 2,135,154       |

\* See Appendix A, Sheet 3 for delineation of Service Zones

TABLE XI-2

MAXIMUM DAILY/FIRE FLOW  
WATER DEMAND BY SERVICE ZONE

| SERVICE ZONE | AVERAGE DAILY<br>DEMAND<br>(MGD) | MAX. DAILY<br>DEMAND<br>(MGD) | FIRE FLOW<br>DEMAND<br>(MGD) | TOTAL<br>DEMAND |
|--------------|----------------------------------|-------------------------------|------------------------------|-----------------|
| A            | 0.328                            | 0.492                         | 0.333                        | 0.825           |
| B            | 0.078                            | 0.117                         | 0.078                        | 0.255           |
| C            | 0.340                            | 0.510                         | 0.355                        | 0.865           |
| D            | 0.284                            | 0.426                         | 0.289                        | 0.715           |
| E            | 0.242                            | 0.363                         | 0.245                        | 0.608           |
| F            | 0.209                            | 0.313                         | 0.222                        | 0.535           |
| G            | 0.422                            | 0.633                         | 0.422                        | 1.055           |
| H            | 0.272                            | 0.408                         | 0.278                        | 0.686           |
| TOTALS       | 2.175                            | 3.262                         | 2.222                        | 5.544           |

## CRITERIA:

1. Average Daily Demand per resident = 145 gpd  
Average Daily Demand per tourist = 116 gpd
2. Maximum Daily Demand = Average Daily Demand x 1.5
3. Fire Flow = 3,700 GPM for 10 Hours

3) Adequacy of Existing Water Facilities

The 12-inch diameter transmission mains which service the project area, specifically the lines descending from Route 1 through San Vitores and Tumon Roads appear adequate in both condition and capacity to supply the water requirements of the Plan. Likewise, certain distribution lines and appurtenances within the project area, particularly 6 and 8 inch diameter lines which were installed within the past decade, are probably adequate to function as part of the ultimate water distribution network.

The existing 1.0 million gallon Tumon Loop Reservoir, when placed in operation, will become a major component of the project area's water supply system. It has sufficient capacity to regulate the distribution to the project area to meet the water requirements of the Plan. Other existing water facilities such as lines, valves and pressure regulators must be replaced, upgraded or improved.

4) Land Use

The magnitude and framework of water infrastructure improvements also depends upon the configuration of the Land Use component of the Plan. Specifically, the alignment and size of transmission and distribution lines will be dictated by the location and concentration of areas of significant water demands. Furthermore, actual routing of waterlines will be inevitably and extensively influenced by the availability and size of existing right-of-way corridors. Accordingly, it is assumed that principal water lines will be routed through the San Vitores Road right-of-way corridor and feeder or distribution lines through existing easements or right-of-ways. Water improvements are intended to be routed through the recommended traffic circulation utility ROW network presented in Chapter X and in Plate X-1.

5) Plan of Water Improvements

The plan of improvements as guided by the basis for design will involve upgrading storage and distribution facilities as required to accommodate the water demand expected to be generated upon realization of the Plan. It will include the following specific improvements.

- a) Installation of a new 12" diameter transmission line with appurtenances within the San Vitores Road right-of-way corridor from its intersection with Gun Beach road (near the Okura Hotel) to Tumon Road.
- b) Continuation of the 12" diameter transmission line along Gun Beach Road to Faifai (Gun) Beach.
- c) Continuation of the existing 8" diameter line along Duggan's Gulch Road to connect with the existing transmission line on Route 1.
- d) Installation of 6 and 8 inch diameter distribution lines with appurtenances routed through the proposed utility ROW network.
- e) Activation of the 1.0 million gallon Tumon Loop reservoir and interconnection of the storage facility with the transmission mains feeding the project area.
- f) Replacement of the pressure regulating valves (PRV) at Tumon and San Vitores Roads and installation of a new PRV Station along Duggan's Gulch Road.

- g) All lines will include appropriate fire-fighting and valving appurtenances.

These improvements are shown on Plate XI - 1.

6) Construction Sequence/Schedule of Improvements

As similarly asserted for interior circulation roads, priority for construction of specific water improvements will depend upon function and availability of rights-of-way. It is likewise important to consider that installation of waterlines must logically precede the construction of road improvements. Indeed, the sequence of construction of water improvements will purposely (not coincidentally) resemble that for road improvements.

The proposed improvements which must rank as first priority are those which correct the principal transmission and storage deficiencies of the existing system. These include the following.

- a) Placing the Tumon loop reservoir into service immediately, by linking the trunk with the transmission main servicing the project area through San Vitores Road.
- b) Upgrading the transmission line along San Vitores Road, in advance of or in conjunction with road improvements.
- c) Continuation of the 8" diameter line along Duggan's Gulch Road to connect with the Route 1 transmission line including construction of a new on-line Pressure Regulating Valve Station.
- d) Replacement of Pressure Regulating Valves at San Vitores and Tumon Roads.

The remaining improvements involve distribution facilities where sequence for development are dictated primarily by the availability of existing utility ROW corridors.

The overall sequence of construction and cost estimates of water improvements are shown on Table XI - 3.

B. SEWER SYSTEM

The deficiencies of the existing Tumon Bay sewer system are notorious and have been the subject of public scrutiny since the early 1970's. In order to mitigate the inadequacies of the Tumon sewer infrastructure, hotels have been required by the Government to install on-site sewage holding and pumping facilities and to eject sewage into the system only according to a prescribed schedule. In fact, there is a policy, although unwritten, that no further large developments will be allowed in Tumon until the system deficiencies are rectified. Problems which plague the existing sewage collection and transmission facilities include the following.

- \* An in interceptor along San Vitores Road that is incapable of accommodating peak flows.
- \* A lift station (Fujita Pump Station) which cannot handle peak flows.



- \* A downstream lift station (at Mamajanao on Route 1) whose wet well, at times, cannot accommodate heavy daily flows from the project area.
- \* Undersized collector lines.

With the sewer system already acknowledged as inadequate, it is apparent that the present sewer infrastructure must be extensively upgraded to suit the requirements of the Master Plan.

The basis for design of system improvements will be guided by the following factors.

- \* PUAG - approved criteria for the planning and design of sewerage works.
- \* The ultimate resident and tourist population forecasted by the Plan.
- \* The configuration of the Land Use Plan as depicted in Plate IX-1.

#### 1) Criteria for Design of Sewerage Works

Criteria and standards for the design of sewerage works applicable to the project area are as follows.

- \* Average daily sewage load per person = 90% of average daily water consumption, or:

|                         |   |                                       |
|-------------------------|---|---------------------------------------|
| Resident sewage loading | = | 130 gallons per capita per day (gcpd) |
| Tourist sewage loading  | = | 104 gallons per capita per day        |

- \* Peak Sewage Flow = 3.5 x average sewage flow
- \* Minimum Velocity = 2.0 feet per second
- \* Minimum Pipe Size = 8-inch diameter
- \* Gravity Line Capacity = Peak sewage flow
- \* Pump Station = Peak sewage flow

#### 2) Estimated Sewage Flows

The estimate of sewage flows to be generated within the project area is a function of the water consumption of the ultimate resident and tourist population predicted by the Master Plan. Table XI-4 presents the estimated ultimate sewage loads by Service Zones (See Sheet 3 of Appendix A). It should be noted that the westernmost sector of the project area, designed as Service Zone "A" in the report contained in Appendix A, is served by a system distinct and apart from that which serves the remainder of Tumon. Sewage flows from this sector are conveyed to the Ypao Lift Station, then routed to ultimate disposal through the Tamuning sewer system; the flows from the remainder of the project area are conveyed to the lift station located near the Fujita Hotel, pumped to the Route 1 sewer interceptor through Duggan's Gulch Road, and finally routed to the Mamajanao lift station located near the Harmon Sink. Therefore, an analysis of the sewage flows as well as the consequent recommendations for system improvements must reflect the existence of separate systems in the project area.



TABLE XI-3

TUMON WATER IMPROVEMENTS  
CONSTRUCTION COST ESTIMATE

| PRIORITY | DESCRIPTION OF IMPROVEMENTS                                                                               | UNIT    | UNIT COST* | COST ESTIMATE** |
|----------|-----------------------------------------------------------------------------------------------------------|---------|------------|-----------------|
| ( 1 )    | San Vitores Transmission Main, Gun Beach Road to Tumon Road<br>(12" Ø Main with appurtenances)            | 7080 LF | \$60/LF    | \$ 424,800      |
|          | Dugan's Gulch Road Loop Connection (8" Ø Main with appurtenances)                                         | 800 LF  | \$55/LF    | \$ 44,000       |
|          | PRV Station at Dugan's Gulch (8" Ø )                                                                      | 1 ea    | \$8,000    | \$ 8,000        |
|          | Tumon Loop Tank Connection<br>(12" Ø Line with appurtenances)                                             | 1000 LF | \$70/LF    | \$ 70,000       |
|          | Repair/Replace PRV @ San Vitores and Tumon Loop Roads (12" Ø )                                            | 2 ea    | \$10,000   | \$ 20,000       |
|          | TOTAL COST OF PRIORITY I PROJECTS                                                                         |         |            | \$ 566,000      |
| ( 2 )    | Tumon Village & Tourist Commercial Area Distribution System (6" Ø)                                        | 3700 LF | \$ 50      | \$ 187,000      |
|          |                                                                                                           | 3250 LF | \$ 55      | \$ 178,750      |
|          | Gun Beach Transmission Line<br>(12" Ø Main with appurtenances)                                            | 4000    | \$ 55      | \$ 220,000      |
|          | TOTAL COST OF PRIORITY II PROJECTS                                                                        |         |            | \$ 585,750      |
| ( 3 )    | Tumon Village & Tourist Commercial Area Distribution System (6" Ø)<br>(complete with appurtenances (8" Ø) | 3700 LF | \$ 50      | \$ 187,000      |
|          |                                                                                                           | 1575    | \$ 55      | \$ 86,625       |
|          | TOTAL COST OF PRIORITY III PROJECTS                                                                       |         |            | \$ 425,625      |
|          | GRAND TOTAL COST OF WATER SYSTEM INFRASTRUCTURE                                                           |         |            | \$1,577,375     |

\* Based on 1981 prices

\*\* Does not include Survey, Engineering and Administration. For development cost add 20%.

TABLE XI - 4

**ULTIMATE SEWAGE FLOWS  
BY SERVICE ZONE**

| <b>SERVICE ZONE *</b>        | <b>AVG. DAILY<br/>WATER DEMAND<br/>(MGD)<br/>(1)</b> | <b>AVG. DAILY<br/>SEWAGE FLOW<br/>(MGD)<br/>(2)</b> | <b>PEAK DAILY<br/>SEWAGE FLOW<br/>(MGD)<br/>(3)</b> | <b>PEAK DAILY<br/>SEWAGE FLOW<br/>(GPM)<br/>(4)</b> |
|------------------------------|------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| A                            | 0.328                                                | 0.295                                               | 1.03                                                | 715                                                 |
| B                            | 0.078                                                | 0.070                                               | 0.25                                                | 174                                                 |
| C                            | 0.340                                                | 0.306                                               | 1.07                                                | 743                                                 |
| D                            | 0.284                                                | 0.256                                               | 0.90                                                | 625                                                 |
| E                            | 0.242                                                | 0.218                                               | 0.76                                                | 527                                                 |
| F                            | 0.209                                                | 0.188                                               | 0.66                                                | 458                                                 |
| G                            | 0.422                                                | 1.380                                               | 1.33                                                | 923                                                 |
| H                            | 0.272                                                | 0.245                                               | 0.86                                                | 597                                                 |
| <b>TOTAL<br/>DEMAND/FLOW</b> | <b>A:0.328<br/>B-H:1.847</b>                         | <b>A: 0.295<br/>B-H: 1.662</b>                      | <b>A:1.03<br/>B-H: 5.83</b>                         | <b>A: 715<br/>B-H:4047</b>                          |

COLUMN (1) = Taken from Table  
 COLUMN (2) =  $0.90 \times \text{Column (1)}$   
 COLUMN (3) =  $3.5 \times \text{Column (2)}$   
 COLUMN (4) =  $694 \times \text{Column (3)}$

\* See Sheet 3 of Appendix A for Service Zone locations.

Table XI-5 compares existing versus ultimate peak sewage flows as well as existing versus required lift station capacity. From this Table, it can be readily seen that ultimate flows vastly exceed existing flows, and that the capacity of existing lift stations will be grossly incapable of accommodating the sewerage requirements of the Master Plan.

3) Land Use

The configuration of the Land Use element of the Plan will greatly influence the sizing and the routing of sewage collection facilities. The San Vitores Road right-of-way will serve as the corridor through which the sewer main, or "interceptor sewerline" will be routed. The size of the various segments of the interceptor will be determined by the volume of sewage flows from tributary areas, which in turn will be determined by land use. The heaviest sewage flows are characteristically expected from areas designated as Residential and Resort Zones.

The location of sewage collection lines will be dictated by the availability of legal rights-of-way or easements. Accordingly, it is envisioned that the sewer collection infrastructure will be routed through the interior traffic circulation network presented on Plate X-1.

4) System Improvements

The upgrading of the sewer infrastructure will involve improvements to the collection, interceptor and pumping facilities located in the project area and to the Mamajanao lift station located along Route 1. Generally speaking, improvements will include the replacement of the San Vitores interceptor; new collector lines within the residential and tourist commercial areas; the complete reconstruction of the Fujita lift station and force main; and the modification of the Ypao and Mamajanao lift stations.

A description of specific improvements follows.

- a) Construction of a new interceptor sewer line along San Vitores Road consisting of the following segments:
  - \* 1875 linear feet of 12" Ø line from the Okura Hotel to the Bay View Apartments;
  - \* 2470 linear feet of 18" Ø line from the Bay View apartments to the Fujita Lift Station;
  - \* 800 linear feet of 18" Ø line from the Dai-Ichi Hotel to the Fujita Hotel;
  - \* 350 linear feet of 12" Ø line and 1370 linear feet of 18" Ø line from the Dai-Ichi Hotel to the Fujita Lift Station; and
  - \* 100 linear feet of 30" Ø influent line to the Fujita Lift Station wet well.
- b) Construction of a new lift station to replace the existing Fujita station having a total ultimate pumping capacity of 4000 GPM, including 2050 linear feet of force main from the lift station to Route 1 along Duggan's Gulch Road.

**TABLE XI-5**

**COMPARISON OF EXISTING VS. ULTIMATE  
PEAK FLOWS AND LIFT STATION CAPACITY**

| <b>PROJECT<br/>SECTOR/</b>                                                                          | <b>EXISTING<br/>PEAK FLOWS*<br/>(GPM)</b> | <b>ULTIMATE<br/>PEAK FLOWS**<br/>(GPM)</b> | <b>EXISTING<br/>LIFT STATION<br/>CAPACITY (GPM)</b> | <b>LOCATION OF<br/>LIFT STATION</b> |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|-----------------------------------------------------|-------------------------------------|
| <b>SERVICE<br/>ZONE "A"</b><br><br>(Pacific Islands<br>Hotel to Ypao)                               | 500                                       | 715                                        | 200                                                 | Ypao                                |
| <b>B through H<br/>(Tumon Road<br/>to Fafai Beach)</b>                                              | 1824                                      | 4047                                       | 700                                                 | Near Fujita<br>Hotel                |
| <p>* From Table XI - 5 (Average Sewage Flow X 3.5 X 694)</p> <p>** From Table XI-5 , Column (4)</p> |                                           |                                            |                                                     |                                     |

- c) 19,605 linear feet of 8" and 10" Ø collector lines to serve the residential and tourist commercial areas designated in the Master Plan.
- d) 2020 linear feet of 8" Ø collector line along San Vitores Road, from Pacific Islands Hotel and Beach Colony (formerly Continental Hotel) to the Ypao Lift Station.
- e) Enlarge the wet well at the Ypao Lift Station.
- f) Enlarge the wet well and provide mechanical improvements to the Mamajanao Lift station.

Plate XI-2 shows the layout of the recommended sewer infrastructure improvements.

#### 5) Construction Sequence/Schedule of Improvements

Priority for construction of specific sewer system improvements will be determined first by the importance of the function of the specific improvement, then by the availability of rights-of-way or easements. As is the case for water improvements, the construction of sewers must logically precede or be concurrent with the construction of road improvements. In fact, the sequence of construction of underground improvements will resemble that for road improvements.

The proposed improvements which must be given priority for construction are those which will rectify the inadequacies of the existing system. These include:

- \* The installation of a new interceptor line along San Vitores Road; and
- \* The construction of a new lift station to replace the existing Fujita lift station including a new force main from the lift station to Route 1.

The improvements which rank second in priority include those which upgrade existing facilities to provide for the ultimate sewage flows expected upon implementation of the Master Plan. These include:

- \* The enlargement of the wet wells for both the Ypao and the Mamajanao lift stations; and
- \* Installation of collector lines along existing roads to serve existing residential and commercial developments not now provided with sewer service.

Those improvements which rank last in priority are those which involve the installation of lines in some areas which are only sparsely or not now developed.

Plate XI-2 also presents the recommended priority groupings for sewer system improvements.

#### 6) Sewer Improvement Costs

Cost for construction of improvements by priority are presented in Table XI-6.

TABLE -XI-6

## TUMON SEWER SYSTEM IMPROVEMENTS

## CONSTRUCTION COST ESTIMATE

| PRIORITY | DESCRIPTION OF IMPROVEMENTS                                                                                                           | UNIT         | UNIT COST**          | COST ESTIMATE*               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------|------------------------------|
| I        | San Vitores Interceptor<br>12" Ø line                                                                                                 | 2225 LF      | \$ 70/LF             | \$ 155,750                   |
|          | 18" Ø line                                                                                                                            | 3270 LF      | \$ 80/LF             | 261,600                      |
|          | 24" Ø line                                                                                                                            | 100 LF       | 90/LF                | <u>9,000</u>                 |
|          |                                                                                                                                       |              |                      | \$ 426,350                   |
|          | New Pump Station @ Fujita Hotel<br>(4,000 gpm capacity)<br>Force Main, 18" Ø                                                          | 1<br>2050 LF | LUMP SUM<br>\$ 60/LF | \$ 750,000<br><u>123,000</u> |
|          |                                                                                                                                       |              |                      | \$ 873,000                   |
|          | TOTAL COST PRIORITY I PROJECTS                                                                                                        |              |                      | \$ 1,299,350                 |
| II       | Modificiation of Ypao Lift Station<br>(Enlarge wet well and Replace<br>Inflow/Outflow Piping, Install<br>additional Pumping Capacity) | 1            | LUMP SUM             | \$ 200,000                   |
|          | New Collector Lines<br>* 8" - 10" Lines                                                                                               | 10,280 LF    | \$55/LF              | \$565,400                    |
|          | * 8" Ø line (San Vitores Road-West)                                                                                                   | 2,020 LF     | \$60/LF              | 121,200                      |
|          | Modification of Mamahanao Pump<br>Station - Enlarge Wet Well and<br>Replace Inflow/Outflow works                                      | 1            | LUMP SUM             | \$ 150,000                   |
|          | TOTAL COST PRIORITY II PROJECTS                                                                                                       |              |                      | \$ 1,036,600                 |
| III      | New Collector Lines<br>* 8" - 10" Ø lines                                                                                             | 9325 LF      | \$55/LF              | \$ 512,875                   |
|          | TOTAL COST PRIORITY III PROJECTS                                                                                                      |              |                      | \$ 512,875                   |

\* Construction Cost, not including engineering and Administration Costs

\*\* Based on 1981 Prices.

## C. STORMWATER DRAINAGE

Tumon Bay does not have an established storm drainage infrastructure, although at least five separate drains now discharge stormwater directly into the Bay. Existing storm drains are, in fact, effluent lines from major hotels near the shoreline. While it hasn't been conclusively proven that present stormwater discharges significantly pollute Tumon Bay, it is generally acknowledged that these direct discharges cause turbidity and sedimentation in the lagoon, and they are aesthetically displeasing. For these reasons, there is a strong consensus among concerned local and Federal government agencies that permits be denied for any further discharges, and existing discharges must be eliminated or substantially mitigated in the near future.

Results of recent studies of the configuration and the behavior of the northern aquifer, Guam's drinking water source, indicate that Tumon Bay serves as a major groundwater discharge basin. This phenomenon explains why the Tumon Bay shoreline is riddled with freshwater rivulets. This massive freshwater discharge into the bay is a natural occurrence which must be considered in the design and construction of storm drainage facilities and in the assessment of consequential environmental impacts.

### 1. Storm Water Collection and Disposal Alternatives

With Tumon Bay poised for additional development, the formulation and implementation of a storm drainage collection and disposal plan is a necessity. Ongoing confinement, collection and disposal of stormwater runoff must keep pace with urban development to avoid severe drainage problems as well as their environmental and legal ramifications. However, because Tumon Bay's greatest asset is its clean, unblemished marine environment, conventional storm drainage disposal practices (such as direct discharge into the bay) must be eschewed in favor of more innovative, environmentally acceptable, yet practical, solutions.

Collection of stormwater has limited practical alternatives: through swales and ditches, through catch basins and conduits, or a combination thereof. However, as urbanization takes place, an underground stormwater collection system becomes the most suitable solution for handling runoff. Since storm drainage facilities must invariably compete with other utilities for space within road rights-of-way, planning for this important element of the infrastructure must be concurrent with that for road, water, power and sewer systems. The "Guam Storm Drainage Manual" prepared for the Government of Guam by the Honolulu District, U. S. Army Corps of Engineers," (hereinafter referred to as the Manual) sets forth detailed criteria and standards for the planning and design of storm drainage collection facilities. In fact, the design of drainage facilities for the Tumon Bay storm drainage improvements must conform to the requirements of the Manual.

As is the case with practical methods of stormwater collection, there are only a few alternatives for disposal of runoff. Alternate methods of disposal of stormwater are discussed thoroughly in the Manual; those applicable to this project follow.

#### a) Discharge to the Ocean

This is the conventional and usually the cheapest method of stormwater disposal involving simply the discharge of concentrated runoff into the bay at the shoreline or at some depth on the reef flat. This



practice, although not absolutely ruled-out, is strongly discouraged for Tumon Bay because of the known or suspected eventual adverse environmental effects to the Lagoon.

b) Infiltration

This method of disposal, practiced extensively in northern Guam, uses the percolative qualities of the soil and substratum to allow discharge of stormwater into the ground. The high permeability of limestone and limestone-derived sands make this a feasible disposal alternative for Tumon Bay. Disposal by infiltration may be accomplished on a small scale such as in seepage trenches or dry wells or on a relatively large scale such as in percolation basins. The advantages and benefits offered by this method include:

- \* The elimination of the direct discharge of stormwater into the Bay and its consequent adverse environmental effects;
- \* The retardation of the flow of freshwater into the Bay by the recharging of surface runoff into the transition zone which separates the freshwater lens and salt water; and
- \* Compatibility with the open space, view corridor requirements of the Master Plan.

The disadvantages include the irreversible and expensive commitment of land resources, the limited use offered by areas used for stormwater disposal, and the frequent maintenance required by infiltration basins and wells. Furthermore, since the success of disposal by infiltration depends on the permeability of on-site soils and the relative distance of the water table to the ground surface, the practical application of this method may be quite limited.

2. Storm Drainage Policy

The adoption and implementation of a cogent drainage policy for Tumon Bay is essential if the land use and supporting infrastructure development objectives of the plan are to be realized. Because there are but a few practical and acceptable alternatives available for dealing with the collection and disposal of stormwater in the project area, the planning, design and construction of drainage facilities including financing and the commitment of land resources efforts must be shared equally by both the public and private sectors. Urban development will result in increased surface runoff -- a problem whose solution must be the responsibility of developers whether they be Government or private.

The following policies will serve to guide as well as regulate storm drainage practices in Tumon Bay.

- a) The planning, design and construction of storm drainage facilities must conform to the requirements and standards set forth in the Guam Storm Drainage Manual.

- b) The planning and design of drainage facilities must be concurrent with and be an integral part of the planning and design of a project.
- c) The financing of the design and construction of drainage facilities shall be the responsibility of developers.
- d) Stormwater runoff must be collected and disposed of on-site to the extent practicable.
- e) On-site storm drainage facilities shall be designed to accommodate surface runoff resulting from storms having an exceedance frequency of 10% or less.
- f) The planning and design of drainage facilities shall be coordinated with the Environmental Design Guidelines (Appendix D) of the Master Plan and with other appropriate elements of the road and utility infrastructure plans.
- g) Direct discharge of concentrated stormwater runoff into the bay will not be permitted.
- h) Disposal of stormwater shall, to the extent practicable, be on-site infiltration by shallow percolation basins, seepage trenches or pits, by dry well, or by a suitable combination thereof as required to achieve the disposal of the acceptable volume of surface runoff in a visually acceptable manner.
- i) Innovative stormwater disposal methods are encouraged. Practical uses of stormwater such as irrigation or as a landscaping feature are also encouraged.

These policies are intended for implementation as part and parcel of the mechanism for regulating growth and development of Tumon Bay. They shall be part of the review and permit process for subdivisions, planned unit developments, building construction and public improvements.

### 3. Scheme of Storm Drainage Improvements

The scheme for drainage improvements will focus primarily on the development of major elements of the collection and disposal network by the Government. Nonetheless, it must be emphasized again that the planning, design and construction of the storm drainage infrastructure, including financing and the commitment of land resources, must be shared equally by both the private sector and the Government. Furthermore, it is recognized that the Government of Guam must take the lead in the design and construction of improvements in conjunction with its effort to develop the other major elements of the road and utility infrastructure.

The topography of the project area generally dictates the routing of stormwater collection facilities and the location of disposal facilities. Unlike the design of sanitary sewer systems, pumping is not considered a practical means of collecting and conveying stormwater to ultimate disposal. Accordingly, the planning for drainage improvements is routinely limited by economics to gravity flow systems and is accomplished through the analysis of drainage areas where the flow of

surface runoff is in one general direction. An approximation of the location of the drainage areas for Tumon Bay is shown on Plate XI-3. Generally speaking, the sector between San Vitores Road and the shoreline constitutes one - the largest - drainage area. Here the flow of surface runoff is generally seaward, although following no specifically defined drainage ways. The sector between San Vitores Road and the cliff can be divided into at least five drainage areas, more so for the convenience of hydraulic analysis and programming improvements.

Plate XI - 3 also presents the recommended scheme of drainage improvements for Tumon Bay. The Storm Drainage Improvements Plan seeks to accomplish the following.

- \* Provide a basic framework of collection facilities routed through the recommended access and utility ROW network described under previous sections.
- \* Route principal drainage collection and disposal facilities through and adjacent to the San Vitores ROW.
- \* Designate major areas for stormwater disposal by percolation basins. (The basins are located either on government land or at the lowest practical elevation within a drainage area as indicated on Plate XI - 3).
- \* Enable the programming of the construction of drainage improvements in conjunction with road improvements.

The strategy for construction of drainage improvements involves a twofold approach: Construction of public improvements and installation of private on-site facilities. The following is a description of the recommended scheme of improvements by the responsible sector.

- a) Public Improvements (by Government or through a Government-sponsored program).
- \* Construct major drainage lines along the San Vitores ROW in conjunction with road improvements

#### Diameter of Pipe    Approximate length

|               |         |
|---------------|---------|
| 18" Ø         | 2400 LF |
| 24" Ø         | 2500 LF |
| 30" Ø         | 3400 LF |
| 36" Ø - 48" Ø | 2800LF  |

- \* Construct/develop five percolation basins along the San Vitores ROW and enlarge the existing basins at Ypao Park and near the Guma Trankilidat housing complex in conjunction with road improvements. The percolation basin planned for Matapang Park is contingent upon first resolving the land reparation claims of the San Nicolas Family, et al.

- \* Construct an underground stormwater collection network in conjunction with the development of the traffic circulation and utility ROW corridors.

#### Diameter of Pipe    Approximate Length

|       |         |
|-------|---------|
| 18" Ø | 9700 LF |
| 24" Ø | 3700 LF |
| 30" Ø | 1550 LF |

#### b) Private Drainage Facilities

Private drainage facilities shall be planned, designed and constructed as an integral part of any development which takes place in Tumon Bay. On-site collection and disposal of surface runoff must conform to the aforementioned policies and the standards set forth in the Guam Drainage Manual. A number of alternatives are available for a developer to choose from in the planning and design of drainage facilities to complement his development. The choices range from construction of shallow percolation basins to the installation of seepage trenches and dry wells. Aesthetic standards must be maintained.

Hotels now established along Tumon Bay and disposing of stormwater into the lagoon must eventually adopt one, or a combination of, the following alternatives:

- \* Modify the stormwater collection system and the property land use in order to dispose of the runoff on-site.
- \* Re-direct the stormwater collection system to connect into the proposed public stormwater system.
- \* If possible, mitigate the quantity, quality and velocity of the stormwater runoff to such standards that are acceptable for direct discharge into the lagoon.

#### 4. Development Sequence and Costs

The priority for construction of drainage improvements will be dictated by the development sequence established for urban road improvements. Thus, construction of the main drainage works along and adjacent to the San Vitores Road right-of-way will receive first priority while the various drainage collector lines will be programmed for construction as part of the urbanization of the interior traffic circulation corridors. Plate XI - 3 also shows the recommended sequence for the construction of drainage improvements.

Construction of drainage improvements is an expensive endeavor, frequently costing more per linear foot than water or sewer improvements. Table XI-7 sets forth the cost for construction of drainage improvements in order of priority.

TABLE XI-7

**TUMON STORM DRAINAGE IMPROVEMENTS**  
**CONSTRUCTION COST ESTIMATE**

| Priority |                                                                                  | Unit            | Unit Cost           | Cost Estimate     |
|----------|----------------------------------------------------------------------------------|-----------------|---------------------|-------------------|
| IA       | SAN VITORES DRAINAGE IMPROVEMENTS (For Construction with Boulevard Improvements) |                 |                     |                   |
|          | (1) Lines                                                                        |                 |                     |                   |
|          | 18" Ø Line                                                                       | 2400            | 80                  | \$ 192,000        |
|          | 24" Ø                                                                            | 2500            | 90                  | 225,000           |
|          | 30" Ø                                                                            | 3400            | 120                 | 408,000           |
|          | 36" - 48" Ø                                                                      | 2800            | 150                 | 420,000           |
|          | (2) Percolation Basins                                                           |                 |                     |                   |
|          | Bayview                                                                          | 2 ea (new)      | 20,000              | 40,000            |
|          | Fujita                                                                           | 1 ea (new)      | 75,000              | 75,000            |
|          | Matapang Park                                                                    | 1 ea (new)      | 75,000              | 75,000            |
|          | Guma Trankilidat                                                                 | 1 ea (modified) | 20,000              | 20,000            |
|          | Ypao                                                                             | 1 ea (new)      | 50,000              | 50,000            |
|          | Ypao                                                                             | 1 ea (modified) | 10,000              | 10,000            |
|          |                                                                                  |                 | <u>\$ 1,515,000</u> |                   |
| IB       | COLLECTOR LINES                                                                  |                 |                     |                   |
|          | 18" Ø                                                                            | 2575            | 70                  | 180,250           |
|          | 24" Ø                                                                            | 3700            | 80                  | 296,000           |
|          | 30" Ø                                                                            | 1550            | 100                 | <u>155,000</u>    |
|          |                                                                                  |                 |                     | <u>\$ 631,250</u> |
|          | TOTAL COST PRIORITY I PROJECT                                                    |                 |                     | \$ 2,146,250      |
| II       | COLLECTOR LINES                                                                  |                 |                     |                   |
|          | 18" Ø Lines                                                                      | 3900            | 60                  | 234,000           |
|          | TOTAL COST PRIORITY II PROJECTS                                                  |                 |                     | \$ 234,000        |
| III      | COLLECTOR LINES                                                                  |                 |                     |                   |
|          | 18" Ø Lines                                                                      | 3200            | 60                  | 192,000           |
|          | TOTAL COST PRIORITY III PROJECTS                                                 |                 |                     | \$ 192,000        |

\* Construction Cost, not including Engineering and Contract Administration Costs.

\*\* Based on 1981 Prices.

## CHAPTER XII

### PUBLIC RECREATION, BEACH ACCESS AND PUBLIC SAFETY

This Chapter deals with public recreation resources and plans for the Tumon Bay area as well as public access to the beach, historical sites, and the Government's public safety services in Tumon.

#### A. PUBLIC RECREATION

The project area's developed recreation resources are fully described in Chapter II, Section B. These resources include Ypao Beach Park, Matapang Park, Laderan Tumon Overlook and the Tumon Ballfield. Sirena Beach is a small, undeveloped public beach. The Father San Vitores Monument and Shrine, a privately owned and maintained commemorative, is open to the public (see Plate XII-1).

These facilities are administered and maintained by the Department of Parks and Recreation. Ypao, Matapang and the Tumon ballfield are popular with local visitors and residents; the Tumon Overlook is not well used. Only Ypao Beach Park attracts tourists, mostly for photos and strolling along the landscaped areas.

##### 1) Recreation Improvements

Ypao Beach Park has recently undergone major improvements in facilities and maintenance. The Department of Parks and Recreation is not contemplating additional improvements other than routine repair which, because of the constant park use, is a substantial job.

Additional improvements at Ypao are not recommended at this time; however, if its use continues to increase, additional parking, picnic facilities and multi-purpose courts will be needed in a few years. The Department of Parks and Recreation monitors this use and assesses the need for additional improvements as part of their annual Outdoor Recreation Plan.

At Matapang Park the Batangas Association of Guam, a local, private organization, has expressed an interest to fund improvements. Picnic shelters with barbeque pits, restrooms and possibly a parking area are planned. These are necessary improvements and should be pursued. Inasmuch as Government funds are not involved, these park improvements will not be included in the Master Plan funding requirements.

Part of the Matapang Park land must be designated for a storm drainage percolation basin, as discussed in Chapter XI, Section C. The exact amount of property required and the possibility of a multiple-use arrangement for the basin will be determined at the design stage for the Tumon Bay Storm Drainage Improvements Plan. However, an area approximately 150' x 200' should be reserved to accommodate the basin close to the right-of-way of the proposed San Vitores Boulevard. This percolation basin is contingent upon first resolving the land reparation claims of the San Nicolas Family, et al.

The Tumon Ballfield will be entirely displaced by another storm drainage percolation basin as part of the Tumon Bay Storm Drainage Improvements Plan. The field is now designated for organized league play despite its



substandard dimensions. The Department of Parks and Recreation is amenable to relocating the field to a site with more space to accommodate a standard size facility. Unfortunately, public land does not exist within the Village area, and the cost of purchasing property by the Government is prohibitive. Unless suitable land is donated, therefore, the only practical alternative for Tumon to retain a little league ballfield is to build it at J. F. Kennedy High School (Ypao cannot accommodate such a facility without substantial displacement to existing facilities). Approximately four acres are required, exclusive of parking. The estimated cost is \$46,000 without lighting. Since a local recreational facility as this is recommended for Tumon, this construction cost is reflected in the Master Plan funding requirements.

JFK High School is not an ideal site for a little league field. However, since active sports facilities (football, track and field, and soccer) are already available, this field can be worked into the campus plans. There are no easy answers to retaining a little league ballfield in Tumon because of the land issue. In order to accommodate those who use the existing field on a regular basis, it is recommended that the new ballfield at JFK be constructed before the old field is displaced. This replacement sequence has been provided for in the financing schedule presented in Chapter XVI.

## 2) New Recreation Facilities

At some future date, when development plans for the Fafai Beach area reach the Territorial Planning Commission, the Government should negotiate for public use of enough access and beachfront to provide for a public recreation facility at Fafai. This can be achieved in conjunction with a hotel or resort project in exchange for certain amenities and regulatory adjustments on behalf of the developer at the discretion and good judgment of T.P.C.

Additional public recreation lands in Tumon Bay should be provided at such time as land acquisition funds become available.

## B. SITES OF HISTORICAL SIGNIFICANCE

Two sites on the Guam Register of Historic Places are located in Tumon Bay. These sites are Padre San Vitores Monument and the Latte site at Bijia Beach (designated as the Fafai Complex in the Territory's Historical Preservation Plan). Any work to be performed in these areas will require coordination with the Territorial Archaeologist.

Two men figure prominently in the history of Tumon Bay. They are Father San Vitores and Chief Matapang.

### 1) San Vitores Monument

Although Spanish ships bound for Manila had often visited Guam from 1521 until 1668 for fresh water and food, the Spanish did not establish a permanent garrison until June 15, 1668, when Father Diego Luis de San Vitores and four other Jesuits plus some lay assistants landed on Guam. Accompanying the missionaries was a Spanish garrison force of thirty two soldiers commanded by Capt. Juan de Santa Cruz. After winning the good will of



the natives, the missionaries began to preach the Gospel. A native chief, Quipuha, who befriended them, was particularly helpful when he donated land for a church in Hagatna (Agana). Soon after, Father San Vitores changed the name of the islands to the Mariana Islands in honor of the Queen, who had helped to establish the mission, and in order to erase a name and stigma he thought unjust.

It soon became apparent to the Chamorros that Christianity was a strict way of life, and that they were expected to lead a Christian life. With this realization came increasing bitterness and hatred for the missionaries. Father Morales had to flee from Tinian; but he returned later, accompanied by Father San Vitores. Incident after incident showed that the Chamorros were reluctant to accept the cultural changes that Christianity demanded. An assistant of San Vitores, Pedro, was murdered in Anatahan; and in January 1670, Father Luis de Medina was killed on Saipan. Finally, in July 1670 the Chamorros rose in open rebellion, attacking the fort and mission. The siege lasted for 40 days.

On March 31, 1672 Father San Vitores was in the village of Nisichan on the east side of the island when he heard of the death of a young Mexican catechist, Diego Bazan. He immediately began a return to Agana. The morning of April 2, 1672 found him in the village of Tumhon (Tumon) where he wished to baptize the infant daughter of a Chamorro Chief, Matapang. The chief angrily refused, but Father San Vitores waited until he had left the house and then baptized the girl. When Matapang returned, he threatened the missionary's life. A crowd gathered and suddenly attacked Father San Vitores and his assistant, Pedro Casor. Both were killed.

The San Vitores monument is important in that it marks the spot where he is purported to have been killed. His martyrdom also marks the beginning of the Chamorro wars which continued intermittently for the next 20 years. The marker also commemorates the arrival of Catholic Christianity to the island and the many changes which its adoption brought to the island's culture. It also denotes the beginning of Spanish influence, an influence which still permeates the island culture.

## 2) Chief Matapang

Matapang Park, along Tumon Bay, was named for Matapang, the Chief of Tumhon, who is presumed to be the assailant of Father San Vitores. Several accounts verify the story with slight variations. Matapang was baptized and educated in the doctrines of Christianity by San Vitores. According to two accounts (Carano and Garcia) San Vitores had withdrawn a spear from Matapang's arm which was inflicted by another native. In Le Gobien's account, Matapang had been cured from a disease through the efforts of San Vitores. All accounts, however, concur with the intercession of San Vitores with the result that Matapang's life was saved.

On the morning of April 2, 1672 Matapang decided to give San Vitores a negative response to the request for baptism of his daughter. He further threatened San Vitores with death if his daughter was baptized.

After Matapang left, San Vitores decided to proceed ahead with the baptism despite Matapang's objection. When Matapang returned and learned of San Vitores' action, he became very angry. He and his companion, Hirao, then struck San Vitores' head with a machete, and Matapang drove a spear through San Vitores' chest. In Garcia's version, Hirao struck San Vitores with a cutlass and Matapang ran a large lance through San Vitores' chest. Hirao and Matapang then took the bodies out to sea to dispose of them. The accounts note that when San Vitores' body was thrown into the water, his hands grasped the canoe as if to control it. Matapang struck San Vitores with an oar and quickly rowed to shore.

On May 2, 1672, Captain Santiago, Commander of the military, sought the arrest of San Vitores' murderers. Since Matapang and Hirao had fled, their houses and canoes were burned.

### 3) Sites with Archaeological Significance

It is becoming increasingly clear that the entire Tumon Beach area is most significant in the understanding of the prehistoric period of Guam. It had been thought, until recently, that the changes wrought by pre-war uses as well as post World War II developments had so severely damaged the cultural resources of the Tumon area as to make its value questionable both for research and restoration.

Recent archaeological test excavations in a number of segments of the shoreline dispute this attitude. It is clear that extensive valuable cultural resources are as yet to be located and restored.

Two examples of the potential for recovering invaluable information, as well as artifacts for public education, have been the data recovery at Ypao Beach Park (1978) and the archaeological salvage of extended late Latte Phase burials from the private property located just south of the Bayview Apartments.

The history of settlement of Tumon began perhaps four thousand years ago when Maylao-Polynesian in-migrants from the west and south reached the as yet unpopulated islands. Preliminary study of the Ypao materials reveal remarkably crafted items of personal adornment, beads, pendants and bracelets as well as a particular type of incised, lime-impressed ceramic ware.

Prior to that time, only twelve specimens of the Trade Ware, as it was designated by Alexander Spoehr (1957), had been excavated at the Laulau Rock Shelter in Saipan. Over one hundred of the valuable specimens of Pre-Latte pottery were recovered at Ypao (1978). Time constraints prevented further extensive work there. Still, much information was gathered regarding both Latte and Pre-Latte Phases of Guam's Prehistoric culture.

It would be very safe to state that much more valuable material exists at various points along Tumon Bay including Gogna Beach. Since much of this material is on private property, some type of cooperative effort should be

established between land developers and the Historic Preservation Section of the Department of Parks and Recreation. A check-off process is strongly recommended allowing sufficient time for data recovery by the Guam Archaeology Laboratory. Valuable cultural resources can be saved from destruction, thus preserving the artifacts for both study and public museum display.

This concern for the prehistoric materials extends to the Spanish Colonial period, which has left a legacy of building foundations often located at higher elevations east of San Vitores Road. The remains of Japanese fortifications are also thought to be of interest for tourism as well as education.

#### C. BEACH ACCESS

Beach access routes are also depicted on Plate XII-1. They represent public right-of-ways for pedestrians and vehicles. However, only at Ypao Beach Park is there organized parking. Seven proposed public and private access routes are shown. Most of the proposed routes occur at areas which are now used by the public to gain access to the beach.

The proposed access routes are listed below.

- 1) Ypao Beach Park as it now exists.
- 2) Along the proposed Area of Significant Natural Value between the Pacific Islands Club Hotel and Beach Colony and the Guma Trankilidat housing development. An informal pedestrian access is compatible with the proposed APC regulations to guide development of this site. This is private property.
- 3) Using the Guma Trankilidat access to Sirena Beach. This route skirts the housing development and should only accommodate pedestrian traffic from San Vitores Road. The housing project parking lot is not open to the public. A concrete walkway now leads directly to the Sirena Beach.
- 4) Matapang Beach Park as it now exists.
- 5) Fujita Road Public right-of-way is already dedicated to the beach; however, the last one hundred feet or so are not cleared, giving the appearance of private property.
- 6) San Vitores Beach Access Road. This heavily-used road has been dedicated by the property owner as a public access to the beach.
- 7) Gun Beach Access Road. This privately owned road to Faifai (Gun) Beach is also heavily used by the public. As the surrounding land is approved for development (resort zone) this access should be maintained as a public right-of-way and beach access.

The purpose of beach accesses in Tumon Bay is to guarantee unrestricted access to the seashore by the public. It is not always practical to provide for parking, except when the access is in conjunction with a public park. Parking for those using the

proposed access routes can be accommodated along San Vitores Road (and especially along the proposed San Vitores Boulevard) or along other streets and roads in the vicinity.

#### D. PUBLIC SAFETY

The Department of Public Safety presently operates a substation in the Tumon Bay area. The area under intensive patrol, though, is concentrated on the oceanside of San Vitores Road. Manpower assigned to this substation totals 11 police officers who work alternating 24-hour shifts.

The site of the present substation is near the entrance to Guma Trankilidat. Plans are being prepared to construct a permanent building to replace the mobile home presently occupied. When the new substation is completed, manpower may be increased from 11 to 20 officers. The present manpower contingent and future manpower requirements are dependent upon budgetary approval for any increases.

## CHAPTER XIII

### LAGOON USE AND SHORELINE DEVELOPMENT

The Tumon Bay lagoon, with its fringing reef, clear waters and sandy shoreline is the island's premier tourist attraction. Immortalized by countless travel brochures, postcards and photographs, Tumon Bay lagoon has become epitomized in the minds of tourists as "Guam" itself. Indeed, for those who have not yet visited Guam - as well as for many tourists who have been here - Guam USA and the Tumon Bay lagoon are synonymous.

With this vital importance to Guam's overall competitiveness in the tourist market, the lagoon merits special planning considerations for the Tumon Bay Master Plan. Any development proposal that affects the lagoon must be subjected to sedulous scrutiny in order to minimize adverse effects to the lagoon's quality and attractiveness. In fact, given the delicate balance of any marine ecosystem such as the Tumon Bay lagoon, a policy of preservation garners immediate credibility from among all other possible courses of action.

Despite its vulnerability, however, the lagoon has been a target of many improvement schemes and development proposals during the past decade. Each proposal came smothered in promises of enhancement to Guam's tourist industry, with alleged minimal impact to the lagoon's quality. These have included such ideas as large scale dredging for motorboating and swimming, enlarging the islet to support park facilities, creating a series of several smaller islands, blasting additional passes through the reef margin to enhance surfing and the construction of piers to extend into the lagoon. The pleas for caution by environmental groups and the lack of implementation funds have always defeated these types of plans for lagoon improvements.

#### A. LAGOON PLANNING CONSIDERATIONS

In the 15 years since Tumon Lagoon began earning its reputation of a tropical paradise and tourist destination, scientists have conducted many studies to assess the impact of Tumon Bay development alternatives. These studies range from isolated bathymetric and current surveys; bacterial, temperature and pH monitoring; other selected water quality analyses; algae and coral identification; and several limited fishery resources studies to a littoral survey and a reef/beach atlas. The results of these and other similar studies are compiled in a publication of the Honolulu District, U. S. Army Corps of Engineers, entitled, "Preliminary Planning Considerations for Bay and Shoreside Development in Tumon Bay, Guam," dated March 1981. This report was prepared specifically to assist in the lagoon development aspects of the Tumon Bay Master Plan.

The existing environmental information indicates that marine life in Tumon Bay has neither been depleted nor damaged to a point requiring restoration efforts by man.

But the analysis is not totally encouraging to the future of Tumon Bay tourist industry development. Bacterial and heavy metal contaminants continue to be dumped into the bay at several stormwater discharge sites. This perturbation occurs in swimming areas adjacent to hotel beaches. The abundance of sea cucumbers, estimated at 3 million throughout the lagoon, poses a significant nuisance and source of complaints to tourists who are unfamiliar with the invertebrate's docile, but certainly unattractive, features. A significant stand of algae flora, composed of as many as 50 species, thrives from the intertidal zone to the reef margin. Where this algae washes ashore and decomposes it naturally conflicts with the intentions of tourists who are searching for a private spot to spread their towel and enjoy the sandy beach.



In summary, Tumon lagoon has survived a decade of its most intense development pressures with relatively few and minor adverse consequences. The reasons for this admirable record are open to debate. There is, of course, that natural ability of every ecosystem to absorb, repel and adjust to certain alterations and disruptions without serious sacrifice. Tumon lagoon has no doubt handled its share of man-induced problems in this manner. There is also the protection afforded such a natural resource through various programs and policies administered by various agencies and organizations as the Guam Environmental Protection Agency, the Department of Parks and Recreation, the Department of Agriculture and groups that have volunteered time and resources to clean, maintain and otherwise guard against sources of pollution that threaten the lagoon's quality. The credit, most likely, must be shared among all these efforts.

For now, however, the Territory of Guam is in a much stronger position than ever before to determine the destiny of the Tumon Bay lagoon. Both Federal and local laws and regulations give substantially more leverage to the government for influencing both lagoon and shoreside development decisions. With the passage of PL 12-19 giving the Government of Guam exclusive rights over the first 32.8' of shoreline above the mean high water mark, virtually any development within these environs must first be approved by the local government. The amount of background data and support study required for such approval has steadily expanded during the past few years.

Through the planning process embodied by this Tumon Bay Master Plan the Government of Guam has expressed its first comprehensive preferences for lagoon and shoreline development. These goals and objectives, conceived through the TUBAPAT sessions and other sources identified in Chapters VII and VIII, reflect a consensus among governmental economic development and regulatory agencies as well as tourist industry businesses.

#### B. LAGOON IMPROVEMENTS FOR SWIMMING AND WADING

Additional swimming opportunities for both residents and tourists comprise the most substantial improvements planned for Tumon lagoon. Presently, the only area that is deep enough for year-round swimming is a 400' x 400' popular spot at Ypao Beach Park. This area was dredged in 1967 and is still satisfactory. A new year-round swimming area is proposed at San Vitores Beach, immediately west of the boat access channel, see Plate XIII-1. The dredged area is to be approximately 150' x 250' with a depth ranging from 2' to a maximum of 5'. A raft, suitably anchored to withstand storm-driven waves, is recommended to accommodate shallow diving and other water-related uses.

The Ypao and San Vitores swimming areas are designated to accommodate all year-round swimming activities in Tumon Bay, although many places throughout the lagoon will also support swimming at flood tide water-depths.

Improvements for wading are planned in conjunction with hotel beaches. Consistent with the visitor preference surveys that most Japanese are not interested in actually swimming in Tumon lagoon but rather in wading, these near-shore sites are recommended for maintenance raking, not dredging, to achieve a fairly uniform and coral-free depth. Plate XIII - 1 also depicts the approximate locations, depths and configurations of these wading sites.

While this Plan does not recommend lagoon dredging, it cannot prohibit, per se, such activities. Some hotel developers/owners may desire deeper off-shore waters than those achieved by merely raking the floor of the lagoon. So long as dredging proposals are properly approved by local and federal environmental regulatory agencies (including the studies, hearings and permits inherent in such approvals) and by the local Bureau of Planning, which has responsibility for Plan updating, such improvements could occur in Tumon Bay.

#### C. LAUNCHING RAMP AND ACCESS CHANNEL IMPROVEMENTS

San Vitores Beach is a convenient location for small outboard motorboats to gain access to the ocean. It is the northernmost site on Guam that now accommodates intermittent boat launching, even without a launching ramp or a clearly, defined channel. The beach site is now used during high flood tides for trailer-carried runabouts ranging to as large as 20' LOA. Negotiating the now circuitous, coral-strewn access channel and unmarked reef pass is a test of local seamanship experience.

In response to the residents' attitude survey, local boating and fishing interests and the general development goals for the lagoon and shoreline, boat launching improvements should be reflected in the Lagoon Use Plan. Clearly, there is no necessity for a major launching facility and boat access to offshore waters. These opportunities are adequately provided at the Agana Boat Basin, approximately four miles southwest of San Vitores Beach. Furthermore, the dredging and other alterations to the lagoon required for such a facility are inimical to the scale of improvements expressed earlier in Chapter VII, Planning and Development Objectives.

What should be provided, however, is an unimproved launching area that can accommodate motorboats up to approximately 20' LOA during high flood tide conditions. This is not intended to be a year-round launching ramp facility, but only an area reserved that can be used during the conditions in which the site is now used. A similar scale of improvements is recommended for the access channel leading to the ocean. Here, all coral should be removed within the 15' - 20' wide channel alignment. Dredging is not recommended.

At the reef pass a daybeacon meeting U. S. Coast Guard standards should be erected to assist in the location of the channel by boaters. Widening of this reef pass for boating is not necessary at the present time; however, in the event that future widening becomes necessary it should be planned so as to accommodate local surfing interests.

Two potentially conflicting situations must be avoided in providing for such boating facilities so close to the swimming area. First, the channel must not be deepened because a dangerous water current will develop through the proposed swimming area as ebb tide waters seek their natural exit to the sea through the reef pass. Second, only the channel alignment itself must be cleared of coral to define the channel and discourage boaters from wandering out of the fairway into swimming waters.

#### D. UNDERWATER PRESERVES

This final attraction recommended for Tumon Bay involves no environmental alterations whatsoever. Two areas should be designated as Underwater Preserves where locally rich stands of coral and other marine life can be protected and reserved for study and observation by residents and tourists.



Technically, all marine life within waters shallower than the ten fathoms contour line are already protected under Article V, Chapter IV, Section 12381 of the Government Code. But this is an extremely difficult law to enforce, especially along a 4-mile stretch of beach such as Tumon, annually visited by 300,000 curious, souvenir-collecting tourists. Countless corals, molluscs, sea cucumbers and other marine life fall victim to tourists whose interest often results in these animals lying dehydrated on the beach or left behind in a hotel room.

Two areas in the lagoon have already been identified as particularly enriched with coral and tropical fish (See Plate XIII-1). These sites should be formally designated by legislation as Underwater Preserves, affording them extra attention and protection. They can be featured in local tourism brochures, with special reference to their protected status and penalty for violation. Boating over these areas should also be restricted.

#### E. USES OF THE LAGOON

Certain uses of the lagoon are completely compatible with Tumon Bay's development objectives, and other uses must be specially prohibited. It is beyond the scope and intent of this Master Plan to research an exhaustive list of do's and don'ts for Tumon Lagoon. Some inference can be drawn, however, from studying the goals and objectives that seek to provide a certain preferred image of the lagoon.

Generally, those activities involving non-motorized, water-oriented recreation are encouraged. These include net and pole fishing, swimming, wading, snorkeling, sailing, wind surfing, rafting, paddle boating and other similar boating, and surf boarding.

Conversely, some lagoon uses are clearly detrimental to the intended image. These include, but are not limited to, motor boating (except in the San Vitores channel either to or from the offshore waters), jet skiing and water skiing. Some motorized water craft will obviously be involved with tourist-oriented pursuits which do not interfere with the other preferred uses of the lagoon. These businesses should be eligible for special authorization to operate in Tumon Lagoon. They might include such activities as the slow, quiet transport of people on a sunset cruise, small glass bottom boats touring the underwater preserves and support boats involved with local businesses that are directly dependent on resources from the ocean.

The Department of Parks and Recreation should establish these permitted uses through its authority for promulgating such rules and regulations.

Monitoring and enforcement of these uses would fall under the authority and purview of the Department of Public Safety personnel, who regularly patrol the beaches.

#### F. SHORELINE DEVELOPMENT

A commonality among all objective setters regarding the Tumon Bay shoreline is that it should be zealously guarded as public domain. The Guam Territorial Seashore Protection Act of 1974, as amended, authorized the Government's first comprehensive administration of the island's shoreline. The Shoreline Reserve estab-

blished by this Act includes that land and water area of Guam extending seaward to the ten fathom contour and inland to the nearer of the following two points:

- (1) From the mean high water line for a distance on the horizontal plane of ten meters (32.8 feet); or
- (2) From the mean high water line to the inland edge of the nearest public right-of-way.

Because of the economic importance attached to Tumon Bay's shoreline as a tourist destination, development precautions beyond those established by the Territorial Seashore Act are recommended. While it is unnecessary to preserve more seashore, per se, additional setback regulations are needed to prevent a wall of development at the ten meter contour.

#### Setback Regulations

The following setback regulations are proposed to regulate development from the ten meter reserve, as now established, to a 100 foot contour. Between ten meters (32.8 feet) and 75 feet, vertical construction must not obstruct the visual openness and continuity of the beach areas. Open space, rest and recreation areas, swimming pools, terraces, landscaping and related outdoor improvements are allowable developments in this area. Parking is not permitted. Between 75 feet and 100 feet inland of the mean high water line, single-story structures, covered porches, trellises and similar improvements not exceeding 12 feet in height from the natural grade line can be permitted. Parking is also permitted in this area. Beyond the 100 foot setback, of course, development can occur in conformance with the proposed Tumon Bay Zones Rules and Regulations presented in Appendix B.

A sketch of shoreline development which represents these setback regulations is presented as Plate XIII-2.

#### Need To Establish Mean High Water Mark

The mean high water mark must be definitively established and permanently monumented along the Tumon Bay seashore in order to enforce the existing and proposed setback regulations. This survey work should receive early priority in the implementation so that shoreline related development may be accurately guided.

This project would cost approximately \$12,000 for the total Tumon shoreline.

## PART FIVE

### IMPLEMENTATION STRATEGIES

This Part of the Tumon Bay Master Plan deals exclusively with strategies to implement the urban design plan and all of its components as described in the preceding chapters of Part Four. Such issues as delegation of responsibility, timetables, costs, financing and new legislation are discussed. Also presented in this Part is a chapter presenting financing requirements and investment opportunities as well as a chapter outlining a development strategy for the Government of Guam to pursue after such time that Tumon Bay has reached its saturation density.

The implementation strategies are divided between those that stimulate growth and those that guide growth: a subtle yet distinct comparison separating, (1) government and private enterprise strategies which enhance Tumon Bay's capacity to grow and continue as a competitive tourist destination; and, (2) those actions dealing with the location and appearance of new development in Tumon Bay.

#### CHAPTER XIV

##### STRATEGIES TO STIMULATE GROWTH IN TUMON BAY

Three primary strategies to stimulate growth in Tumon Bay are recommended:

- Upgrade infrastructure;
- Improve the standard of maintenance; and
- Perform lagoon improvements.

Not within the scope of this Master Plan are those strategies designed to promote the growth of tourism, per se, on Guam. That is the subject of another plan entitled, "The Ten-Year Tourism Plan", which is being developed by the Government of Guam in conjunction with this Master Plan. It would be fruitless, of course, to provide for planned growth of tourism-related development in Tumon Bay without first assuring the growth of Guam's total tourism industry.

#### A. UPGRADE INFRASTRUCTURE

The inadequate capacity of infrastructure, particularly sanitary sewer and water facilities, is the most significant obstacle to accommodating additional hotel development in Tumon Bay. Other infrastructure that must be improved to provide for a balance of development capacity throughout Tumon Bay includes the San Vitores Boulevard, an interior vehicular circulation system, and storm drainage.

Project descriptions, costs and construction schedules of all infrastructure plans are described in Part Four. Table XIV-1 recaps these projects, costs and prioritizations.

TABLE XIV-1

COST FOR DEVELOPMENT \*  
OF TUMON BAY INFRASTRUCTURE, BY PRIORITY PHASE

| PROJECT                   | PRIORITY      |              |              | TOTAL COST    |
|---------------------------|---------------|--------------|--------------|---------------|
|                           | PHASE I       | PHASE II     | PHASE III    |               |
| San Vitores Boulevard **  | \$ 4,000,000  | - 0 -        | - 0 -        | \$ 4,000,000  |
| Interior Roads            | \$ 2,242,000  | \$ 2,305,000 | \$ 917,000   | 5,464,000     |
| Water Improvements        | 680,000       | 702,900      | 510,750      | 1,893,650     |
| Sewer Improvements        | 1,560,000     | 1,250,000    | 615,450      | 3,425,450     |
| Storm Drainage Facilities | 2,575,500**   | 280,800      | 230,400      | 3,085,700     |
| TOTALS                    | \$ 11,057,500 | \$ 4,538,700 | \$ 2,273,600 | \$ 17,869,800 |

\* Includes construction costs plus 20% for survey, engineering, contract administration and contingencies.

\*\* Includes \$1,515,200 for storm drainage facilities associated with San Vitores Boulevard.

B. IMPROVE THE STANDARDS OF MAINTENANCE THROUGHOUT TUMON BAY

In order for Tumon Bay to project the image of a first-class tourist (and residential) area that this Master Plan is seeking to achieve, a general overhaul of the area's physical appearance is necessary. If this area is to be a showcase of tropical beauty, certain housekeeping measures must be carried-out on a continuing, dependable basis.

Tumon is one village among several in the municipality of Tamuning; and Tamuning, in turn, is one of nineteen municipalities in Guam. Unquestionably, the overall level of maintenance throughout Guam has steadily improved during the past decade, and presently boasts its highest standards ever. But for Tumon Bay to equally share this Territorial-wide standard is, nonetheless, insufficient. Tumon Bay should be special.

Presently, several Government of Guam agencies share maintenance responsibilities throughout the area. For example, Public Works handles road maintenance, road shoulder mowing, street sweeping, solid waste collection and abandoned vehicle pick-up; and Parks and Recreation is in charge of beach maintenance and maintenance at Ypao Beach Park, including custodial services at restrooms. Other agencies are in charge of repairs (as opposed to maintenance) of their respective utilities: PUAG for water and sewer, GPA for power and GTA for telecommunications. The overall problem is not so much that maintenance does not occur throughout Tumon Bay but that the standard of this maintenance does not meet the quality criteria of a first-class tourist destination.

Tumon Bay must have an exclusive advocate for its maintenance requirements in order to reach and retain a standard that excels. This standard of maintenance is defined as:

- \* Dependable service for those activities which occur routinely, in accordance with a prescribed daily or weekly schedule, such as solid waste collection, street sweeping, custodial services, beach clean-up and landscape maintenance.
- \* Responsive services for those activities which are required on an as-needed basis such as grass mowing at parks and along road shoulders, abandoned vehicle pick-up, painting and repair of facilities, and emergency repair of water, sewer, power and telephone malfunctions.

In order to avoid any disruption of government programs and schedules to accommodate increased maintenance services to Tumon Bay, most services should be provided by private contractors. Contractors can adequately perform nearly every maintenance and repair requirement.

1) Responsible Agency to Administer Maintenance Work

In order to administer a quality maintenance program of this type, a responsible agency with an exclusive source of funding is necessary. Several Government of Guam agencies have staffs and ongoing programs which deal with Tumon Bay related improvements. However, only one agency is

specifically charged with responsibility to oversee Guam's tourism industry and holds, therefore, a vested interest in the appearance of Tumon Bay: The Guam Visitors Bureau. This Bureau has a built-in focus on Tumon Bay as the heart of Guam's tourism industry.

The Guam Visitors Bureau is public, non-profit membership corporation. It has a private membership consisting of some 200 firms and individuals who contribute both ideas and dues. The organization is directed by a 13-person Board of Directors, five of whom are appointed by the Governor and eight elected by GVB members. The Bureau is funded by an annual "Grant-In-Aid" from the Legislature which must be matched by private sector contributions. Currently, the private match is made in both cash and in-kind contributions. The cash contribution accounts for 20% of the Bureau's budget, with the remaining funds coming from the Legislature. In 1980, the Legislature granted \$1,568,191 to GVB.

The main purpose of GVB is to actively promote Guam as a tourist destination and to advise governmental and private interests as to the best ways to develop a local tourism industry. GVB's objective in promoting is to maintain the number of visitors coming to Guam and to attract higher income groups. With this mission, the Bureau monitors the pulse of Tumon Bay and is the most appropriate agency to administer the maintenance program.

2) Tumon Bay Maintenance Coordinator

Only one new individual, called the Tumon Bay Maintenance Coordinator, is required to administer this work. His proposed position at GVB is reflected in Table XIV-2, GVB Organization Chart. Administrative support can be obtained from the existing GVB operations. The Coordinator's qualifications must include:

- \* Familiarity with community maintenance operations;
- \* Knowledge in contracting maintenance and repair services;
- \* Experience in administering ongoing projects with little supervision; and
- \* General understanding of Guam's tourism industry.

The Tumon Bay Coordinator should be an unclassified employee of the Guam Visitors Bureau who reports to the Deputy Manager. His starting salary should range from \$18,000 to \$20,000, depending on qualifications. The Tumon Bay Coordinator should not be confused with a complaint department for Tumon Bay problems. He is an implementor of those vital services necessary to upgrade the maintenance standards of the area to that of a first-class tourist and residential area.

The scope of his responsibilities are to be:

- a) Prepare programs for each maintenance activity under the cognizance of GVB. Each program must include:  
schedule of service,  
standard of quality,  
materials and equipment,  
provisions for emergency services, and  
estimated cost.
- b) Prepare annual budget documents to reflect the services and standards of maintenance approved by the GVB Board of Directors.
- c) Coordinate and follow through on all work performed by appropriate governmental agencies to repair and/or upgrade infrastructure within Tumon Bay.
- d) Administer and account for all of the funds designated for this work by the GVB budget.

Funds for the Tumon Bay Coordinator and the maintenance programs under his jurisdiction are to be earmarked from the Tourist Attraction Fund, subject to annual appropriations for the operation of the Guam Visitors Bureau. Because portions of these maintenance programs are already budgeted within current year and continuing appropriations, an initial transitional budget is required. This transitional budget should include the following items.

Personnel

|                       |          |
|-----------------------|----------|
| Tumon Bay Coordinator | \$20,000 |
|-----------------------|----------|

Travel

|                                        |     |
|----------------------------------------|-----|
| Mileage reimbursement                  |     |
| 50 miles/week x 52 weeks x \$0.30/mile | 780 |

Contractual

- a) Solid Waste Collection  
Parks and Seashore (daily)  
Residential (twice weekly, only in the event  
that Public Works cannot provide service;  
budget for six weeks service) 1,500  
Commercial accounts (daily, only in the  
event that Public Works cannot provide  
service; chargeable to business) - 0 -  
Abandoned vehicles collection (as needed) 1,000
- b) Mowing  
Park and recreation areas  
and median strips (weekly) 26,000



|    |                                                                       |                      |
|----|-----------------------------------------------------------------------|----------------------|
| c) | Boonie clearance and maintenance of public and private land (monthly) | 12,000               |
| d) | Seashore clean-up and beach maintenance (on-going)                    | 60,000               |
| e) | Landscaping and maintenance (on-going)                                | 60,000               |
| f) | Street sweeping for reconstructed San Vitores Boulevard (weekly)      | 6,400                |
| g) | Painting and repair of public facilities (annual)                     | 5,000                |
|    | Materials and Supplies                                                |                      |
|    | Office Supplies                                                       | 1,000                |
|    | Equipment                                                             |                      |
|    | None                                                                  | - 0 -                |
|    | <b>TOTAL</b>                                                          | <b>\$230,180</b>     |
|    |                                                                       | Say <b>\$230,000</b> |

After the first year's start-up costs, the annual maintenance budget can be reduced to \$150,000 with a 5% annual increase thereafter.

It is unnecessary to budget from the Tourist Attraction Fund for the repairs and maintenance of water, sewer, power and telecommunications in Tumon Bay since local utility agencies generate their operating funds through fees and charges levied on their customers. Street and highway repairs are budgeted by the Department of Public Works and appropriated from the Territorial Highway Fund as part of the Department's annual operation.

#### C. PERFORM LAGOON IMPROVEMENTS

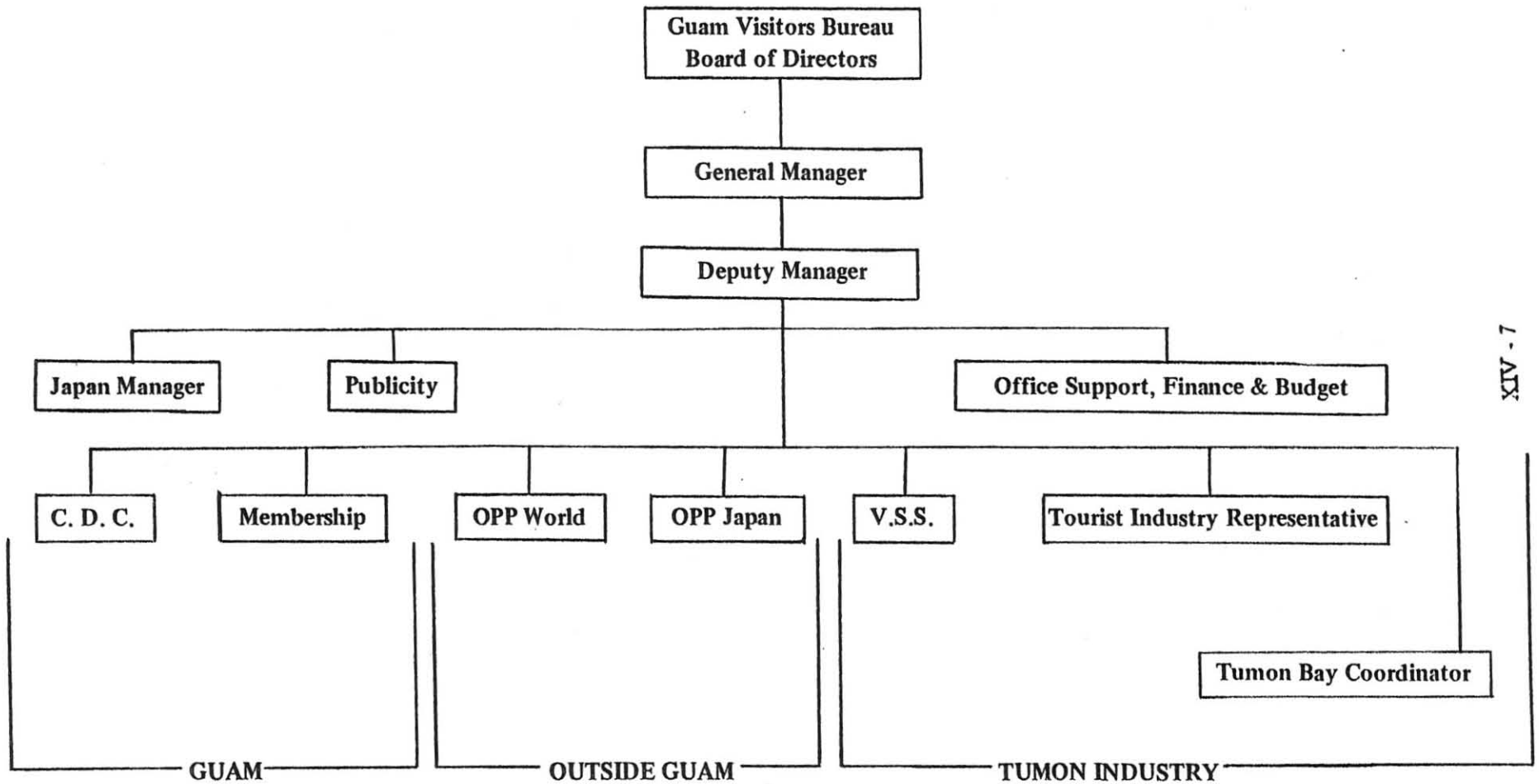
The lagoon improvements outlined in Chapter XIII of this Master Plan are very important aspects of the overall incentives to stimulating additional tourism development in Tumon Bay. Two categories of implementation strategies are necessary to achieve the proposed lagoon development plan: those which the Government of Guam must undertake entirely, and those which local hotels must undertake, with administrative assistance and support from the Government of Guam.

The Government of Guam must be entirely responsible for two improvements: dredging at the San Vitores Beach Park and improving the boat access channel between the Park and the Philippine Sea, including the erection of a daybeacon.

Both projects require a permit from the U. S. Army Corps of Engineers. In order to complete the application for these projects a complete description of the work to be performed plus an environmental assessment of the anticipated impacts are needed. The applicant of this work is the Government of Guam and, as such, it must abide by a predetermined permit application process, as described in the following section. It is recommended that the Public Works personnel handle the permit work since they are familiar with these requirements and this type of project from previous experiences.

# GVB ORGANIZATION CHART

TABLE XIV - 2



The general scope and cost estimates are:

|                                                                                                                                                                                                             |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Dredging of 3,470 cubic yards to construct a<br>150' x 250' x 5' (average) swimming area.<br>Dredged materials to be stockpiled near beach<br>site for later use or disposal by Government                  | \$29,150      |
| Clearing 3,550 square yards of coral within a 20'<br>wide (maximum) channel between the San<br>Vitores Beach and the Philippine Sea and disposal<br>of approximately 355 cubic yards of coral<br>and rubble | 18,000        |
| Erecting one day beacon channel marker at the<br>channel entrance                                                                                                                                           | 1,000         |
| TOTAL                                                                                                                                                                                                       | \$ 48,150     |
|                                                                                                                                                                                                             | Say \$ 48,000 |

The beachfront wading areas where clearing is planned are also subject to the U. S. Army Corps of Engineers permit process, but whether or not a permit is actually required depends upon the final scope of the clearing. The Government of Guam should support this work, as it complies with this Master Plan, but the individual hotels should bear all other responsibilities as applicants, including the full costs. Clearing and disposal of the coral and rubble in these areas, as indicated on Plate XIII-1 will involve 205,000 square yards of area and disposal of 5,130 cubic yards of material. Total cost is estimated at \$221,500, or \$0.80/square yard for clearing and \$11.20/cubic yard for disposal.

#### Procedure for Dredging Permits

Before initiating work at either the wading areas along hotel beachfronts or the dredging at San Vitores Beach Park, three clearances must be secured. From the Government of Guam, both the Department of Land Management as well as the Coastal Zone Management Program, Bureau of Planning, must be involved. At the Federal level, the District Office in Honolulu of the U. S. Army Corps of Engineers has permit issuing authority.

The Department of Land Management is the coordinating point for all Government of Guam agencies and the Governor's spokesman in replying to the requirements or inquiries from a Federal agency that may become involved with these projects. The Department of Land Management will not issue a dredging permit, per se, but it will assure that all local regulations have been satisfied before recommending approval of the work to the Corps of Engineers. This includes TPC coordination.

The Coastal Zone Management Program of the Bureau of Planning wields a singularly significant influence over dredging permits by virtue of the Federal consistency provision of the Coastal Zone Management Act of 1972. Dredging must comply with the Territory's approved coastal zone management program and be conducted in a manner conducive with that program.

The Bureau of Planning reserves the right to review all permit applications for such dredging work and may require additional information to assess the impact and consistency of the project. Generally, a permit will not be issued without the Bureau's concurrence that the project is consistent with the Territory's coastal zone management program. The Master Plan itself will undergo similar scrutiny for consistency with the coastal zone management program.

The U. S. Army Corps of Engineers maintains the final permit issuing authority for these proposed Tumon Bay projects. Under their authority in Section 10 of the River and Harbor Act of 1899, Section 404 of P. L. 92-500 and Section 103 of P. L. 92-532 structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into those waters, and the transportation of dredged material for the purpose of dumping it into ocean water requires a permit.

The actual permit required (Engineer Form 4345) and its supporting documentation, including an Environmental Impact Assessment - or an Environmental Impact Statement if required by the District Engineer - is subjected to the following review process.

1. Application received, acknowledged and processed.
2. Public notice issued and comments received by concerned agencies, groups and individuals.
3. Public hearing to present the proposed project and to air the comments, both for and against the dredging.
4. Comprehensive, in-depth review of the application, all supporting documents and comments received by Corps of Engineers.
5. Approval, if warranted, of the application. In the event an application is disapproved, the applicant is advised to reconsider the proposal and examine alternatives or to modify the original project design and eliminate the objectionable features.
6. Permit issued.
7. Commencement of dredging or clearing as stipulated by the permit and in accordance with the approved application.

Three to six months should be allowed for securing permits for the proposed clearing and dredging projects in Tumon Bay.

## CHAPTER XV

### STRATEGIES TO GUIDE GROWTH IN TUMON BAY

This Chapter presents those implementation strategies and actions which guide the location and appearance of new development in Tumon Bay. The major parts follow.

1. Formal adoption of this Tumon Bay Master Plan as an element of the Guam Comprehensive Development Plan, as stipulated in P.L. 12-200, as amended.
2. Enactment of the Tumon Bay Land Use Plan.
3. Enactment of the Tumon Bay Zone Law.
4. Adoption and promulgation of the "Tumon Bay Resort Zones Rules & Regulations" by the Territorial Planning Commission.
5. Adoption and promulgation of the "Environmental Design Guidelines for Tumon Bay" by the Territorial Planning Commission.
6. Creation of the Tumon Bay Environmental Review Advisory Committee to assist TPC in applying the Environmental Design Guidelines to future development.
7. Formal assignment of the Bureau of Planning, Government of Guam, to monitor, evaluate and conduct appropriate continuing planning services for Tumon Bay.

#### A. ADOPTION OF THE TUMON BAY MASTER PLAN

In order for this Master Plan to guide future public and private development decisions in Tumon Bay it must be formally adopted as a component of the Guam Comprehensive Development Plan. This adoption process is stipulated in P.L. 12-200, as amended. Once adopted, the Plan becomes the basis for official operating policy to guide Tumon Bay development decisions. Appendix E is draft legislation to, among other things, officially adopt the Tumon Bay Master Plan.

#### B. ENACTMENT OF THE TUMON BAY LAND USE PLAN

The Tumon Bay Land Use Plan, as presented in Chapter IX and Plate IX-1, requires legislative enactment for implementation. Accompanying this Plan must be a zoning ordinance which describes the permitted uses and other characteristics of the new land uses. This proposed law to enact the Plan is found in Appendix E.

Both the Tumon Bay Land Use Plan and the proposed Zoning Law must be transmitted to the Legislature by the Governor, requesting the appropriate scheduling, hearing and action for enactment.

C. TUMON BAY ZONING LAW

The existing "H" Zone designation for Tumon Bay must be repealed in order to rezone the project area as recommended in the Land Use Plan, Plate IX-1. Appendix E, "An Act Relative to the Approval of the Tumon Bay Master Plan, the Creation of Zones for Tumon Bay and the Rezoning of Land in Tumon Bay" will accomplish the necessary zoning amendment, upon enactment, to establish the Tumon Bay Resort Zone, Tourist-Commercial Zone and Residential Zone.

D. TUMON BAY RESORT ZONES RULES AND REGULATIONS

The Territorial Planning Commission currently has the authority to prepare and promulgate rules and regulations for the Resort-Hotel "H" Zone which encompasses the Tumon Bay Project area. Interim rules and regulations have been in effect since 1978, but nothing has been available to provide articulated direction to developers and to TPC members. Appendix B contains the final Rules and Regulations, incorporating specific requirements and criteria in order to clarify application and development standards for the "H" Zone. These are ready for review, approval, promulgation and enforcement by the Territorial Planning Commission and shall remain in effect throughout Tumon Bay for the proposed Land Use Plan and Zoning Law (Appendix E) or for the existing Resort-Hotel "H" Zone.

Land use and environmental design for Tumon will continue to be administered by the Territorial Planning Commission under the Authority of Public Law 14-41 as amended by Public Law 14-72 and 14-82. The interim Resort-Hotel "H" Zone Rules and Regulations are refined and updated by virtue of the Rules and Regulations presented in Appendix B to reflect the Master Plan recommendations. These final Rules and Regulations (upon adoption by the Territorial Planning Commission), the Tumon Bay Land Use Plan (upon adoption by the Guam Legislature as a component of the Tumon Bay Master Plan), and the Tumon Bay Zoning Law (upon enactment as public law), will serve as the comprehensive land use document for Tumon Bay.

E. ENVIRONMENTAL DESIGN GUIDELINES FOR TUMON BAY

As compared to the rather rigid standards embodied by the Rules and Regulations and the Tumon Bay Zoning Law, many other "subjective" guidelines are needed to achieve the overall Tumon Bay image. These Environmental Design Guidelines for Tumon Bay, found in Appendix C, cover such aspects as view corridors, building texture, landscaping, etc.

These guidelines are intended as a tool to guide development within an overall framework of visual quality and environmental design. The guidelines are broad and performance-oriented, in order to encourage individual and imaginative design solutions. The guidelines operate as suggestions; the manner and methods for conforming to their objectives are the creative responsibility of the developer and his designer.



The actions of planning and design for Tumon Bay involve a standard of visual quality which will enhance the unique character of the community, the quality of life of its citizens and those who visit, as well as the image these people have of Tumon. In this broad respect, the design of development affects not only the developer but also the community-at-large. This is the assumption underlying these guidelines: that there are instances when the broad interests of the general public must be balanced against the sometimes narrower interests of individual property owners.

Structures should meet appropriate standards for environmental design just as they must meet building code standards for safety and meet zoning standards for use and location. The Guidelines address aesthetic matters not covered by existing zoning laws or building codes. They express the community's right to participate in decisions affecting the visual quality and order of its environment.

The Guidelines do not limit growth or regulate where growth takes place; that is within the scope of the land use portion of the Master Plan. Similarly, they do not guarantee creative or sensitive design. At the most elementary level, the Guidelines are a compilation of desirable design considerations as an "idea book" to encourage a cohesive tourist oriented image, compatible building design, inclusion of improvements to the environment and the provision of amenities. The Guidelines encourage new development which is appropriate to its setting and which meets an overall framework of visual quality and environmental design. In addition, the Guidelines are intended to encourage sounder business investment and higher economic returns on a long term basis as a result of quality appearance through design.

The Guidelines are performance oriented, not prescriptive. They suggest concepts and do not dictate methods. Many of the Guideline standards are repetitive in the sense that they emphasize certain fundamental approaches to obtain the desired overall image. A predominant criterion is the preservation of existing vegetation and the provision of new mature landscaping. Proper landscaping treatment, more than any other single aspect of development, will absorb the disruptive effects of new construction and unify the tropical resort image.

These Guidelines are ready for review, approval, promulgation and application by the Territorial Planning Commission. They will remain in effect for either the existing "H" Zone or the proposed Tumon Bay Land Use Zones.

#### F. TUMON BAY ENVIRONMENTAL REVIEW COMMITTEE

A special committee is recommended to assist the TPC in applying the Environmental Design Guidelines. Structured similar to the Subdivision and Development Review Committee (SDRC), the advisory group will review all applications for development in Tumon Bay and recommend courses of action to the TPC which are consistent with the Environmental Design Guidelines. The composition, authority and operating procedures for this Committee are found in Appendix D.

#### G. CONTINUING RESPONSIBILITY FOR TUMON BAY PLANNING

The adoption and implementation of this Tumon Bay Master Plan does not signal an end to planning services for the area. Responsibility must be assigned to moni-



tor the implementation strategies and assure that they are achieved, to evaluate the success of those actions, and to provide continuing data collection and planning services as required by the Tumon Bay project area.

The most appropriate agency to conduct this work is the Bureau of Planning. Its ongoing planning services are tailored to master plan administration and evaluation. Furthermore, its coordinative role for various elements of the Territory's comprehensive development plan creates a solid base of expertise to orchestrate the various implementation strategies which require input from many departments and agencies throughout the Government of Guam. A formal assignment of this responsibility should be made by the Governor of Guam to the Director of Planning by Executive Order. Part of this continuing planning responsibility involves the formal designation of two Areas of Particular Concern for Tumon Bay. This task is outlined in Section C of Chapter IX.

## CHAPTER XVI

### FINANCING REQUIREMENTS AND INVESTMENT OPPORTUNITIES FOR TUMON BAY

Both public and private financial arrangements are required to implement the strategies that will stimulate growth in Tumon Bay.

#### A. FINANCING PUBLIC IMPROVEMENTS

The key to implementing the strategies which will stimulate growth in Tumon Bay require substantial funding either by the local government or through some other financing mechanism, or both. In 1970, when this same dilemma was first debated by Executive and Legislative Branches of the Territorial Government, P.L. 10-166 and two years later an amendment, P.L. 11-145, were passed to resolve the need for a continuing source of tourism-oriented funding. These laws, more commonly known as the Tourist Attraction Fund, levied a 10% excise tax against charges for accommodations by all transient occupants in hotels and lodging houses on Guam. This tax became effective on July 1, 1972. The accumulated funds were to be earmarked for improving the physical facilities of public park and recreation areas in the Territory. The Government of Guam has collected several million dollars through the Tourist Attraction Fund, and in 1980 alone the collection was \$1.4 million.

The Tourist Attraction Fund has already financed many important projects in Tumon Bay, including the Ypao Beach Park improvements, the Department of Public Safety Tumon Substation and the Tumon Beach Maintenance and Improvements project. Other tourist and public recreation projects throughout Guam were also paid through this Fund.

Unfortunately, the Tourist Attraction Fund has also been an easy target for non-tourist recreation expenditures. Because it is a self-replenishing source of revenue, many appropriation bills exploit the Fund to subsidize "related" (and even unrelated) projects. Political reality dictates that an unobligated source of money will eventually fall victim to the relentless pressures for public funding of countless proposals. The Tourist Attraction Fund has been no exception. What remains, therefore, in order to guarantee the availability of funds to implement this Master Plan's various strategies and projects from the Tourist Attraction Fund is a mechanism whereby money is, without question, irrevocably obligated to Tumon Bay improvements.

#### Tourist Attraction Fund Obligation for Public Improvements

The recommended use of the Tourist Attraction Fund is to reserve certain amounts to:

- 1) fund the Guam Visitors Bureau Tumon Bay Maintenance Coordinator and maintenance work;

- 2) fund certain projects and programs identified in the Government's "Ten Year Tourism Plan";
- 3) fund eligible projects identified in the Government's "Outdoor Recreation Plan"; and
- 4) to pledge the remaining amount against a revenue bond for Tumon Bay improvements.

With the TAF totally absorbed by ongoing contracts and debt retirement of one or more bonds, the competing demands for TAF subsidization of other proposals can be irreversibly denied.

Table XVI-1 establishes the projected revenues from the Tourist Attraction Fund based on the projected tourist arrivals as established in Table XVI-1. The base year data for this projection is 1980 when 300,000 visitors yielded approximately \$1.5 million into the TAF. These projected visitor arrivals are rounded off to the nearest 5000. More precise projections are developed in the Government of Guam's Ten Year Tourism Plan.

TABLE XVI-1  
PROJECTED TAF REVENUES  
1981 - 1990

| YEAR | PROJECTED VISITOR<br>ARRIVALS | PROJECTED TAF<br>REVENUES |
|------|-------------------------------|---------------------------|
| 1981 | 315,000                       | \$1,575,000               |
| 1982 | 330,000                       | 1,650,000                 |
| 1983 | 345,000                       | 1,725,000                 |
| 1984 | 365,000                       | 1,825,000                 |
| 1985 | 380,000                       | 1,900,000                 |
| 1986 | 400,000                       | 2,000,000                 |
| 1987 | 420,000                       | 2,100,000                 |
| 1988 | 445,000                       | 2,225,000                 |
| 1989 | 465,000                       | 2,325,000                 |
| 1990 | 490,000                       | 2,450,000                 |

It is possible, but not particularly reliable, to extend these projections beyond 1990 at this time.

The projects and cost estimates recommended by this Master Plan are summarized in Table XVI-2. This Table also recaps the recommended implementation schedule for each project, in order to highlight the close relationship among the various phases for constructing the infrastructure projects.

TABLE XVI-2  
SUMMARY OF  
TUMON BAY MASTER PLAN  
PROJECT AND COSTS

| CHAPTER<br>REFERENCE | PROJECT                   | COST        | IMPLEMENTATION<br>SCHEDULE |
|----------------------|---------------------------|-------------|----------------------------|
| X                    | San Vitores Boulevard     | \$4,000,000 | One phase                  |
| X                    | Interior Roads            | 5,464,000   | Three phases               |
| XI                   | Water Improvements        | 1,893,650   | Three phases               |
| XI                   | Sewer Improvements        | 3,425,450   | Three phases               |
| XI                   | Storm Drainage Facilities | 3,085,700   | Three phases               |
| XII                  | San Vitores Beach Park    | 120,000     | One phase                  |
| XII                  | Tumon Ballfield           | 46,000      | One phase                  |
| XIII                 | Lagoon Improvements       | 48,000      | One phase                  |
| XIII                 | Shoreline Survey          | 12,000      | One phase                  |

With these parameters in mind, therefore, the following Tables XVI-3 through XVI-6 assign all Master Plan projects according to revenue bond groupings which reflect implementation schedules and bond ceilings.

TABLE XVI-3  
REVENUE BOND GROUP NO.1

| Project                                                                 | Cost            |
|-------------------------------------------------------------------------|-----------------|
| San Vitores Boulevard, Complete                                         | \$4,000,000     |
| Water Improvements, Phase I                                             | 680,000         |
| Sewer Improvements, Phase I                                             | 1,500,000       |
| Storm Drainage Facilities<br>(San Vitores Boulevard portion of Phase I) | 1,515,200       |
| San Vitores Beach Park                                                  | 120,000         |
| Lagoon Improvements                                                     | 48,000          |
| Tumon Ballfield                                                         | 46,000          |
| Shoreline Survey                                                        | 12,000          |
| TOTAL                                                                   | \$7,981,200     |
|                                                                         | SAY \$8,000,000 |
| ANNUAL BOND PAYMENT NO. 1                                               | \$1,000,000     |

TABLE XVI-4  
REVENUE BOND GROUP NO. 2

| Project                                                     | Cost            |
|-------------------------------------------------------------|-----------------|
| Interior Roads, Phase I                                     | \$2,242,000     |
| Storm Drainage Facilities<br>(Remaining portion of Phase I) | 1,060,300       |
| TOTAL                                                       | \$3,302,000     |
|                                                             | SAY \$3,300,000 |
| ANNUAL BOND PAYMENT NO.2                                    | \$ 412,500      |

TABLE XVI-5  
REVENUE BOND GROUP NO. 3

| Project                             | Cost            |
|-------------------------------------|-----------------|
| Interior Roads, Phase II            | \$2,305,000     |
| Water Improvements, Phase II        | 702,900         |
| Sewer Improvements, Phase II        | 1,250,000       |
| Storm Drainage Facilities, Phase II | 280,000         |
| TOTAL                               | \$4,538,700     |
|                                     | SAY \$4,600,000 |
| ANNUAL BOND PAYMENT NO. 3           | \$ 575,000      |

TABLE XVI-6  
REVENUE BOND GROUP NO. 4

| Project                              | Cost            |
|--------------------------------------|-----------------|
| Interior Roads, Phase III            | \$ 917,000      |
| Water Improvements, Phase III        | 510,000         |
| Sewer Improvements, Phase III        | 615,450         |
| Storm Drainage Facilities, Phase III | 230,400         |
| TOTAL                                | \$2,273,600     |
|                                      | SAY \$2,300,000 |
| ANNUAL BOND PAYMENT NO. 4            | \$ 287,500      |

Neither the Ten Year Tourism Plan nor the Outdoor Recreation Plan forecast project and program needs against specific proceeds from the TAF. However, funds can be earmarked to each of these plans for implementation on a year by year or a longer basis.

Table XVI-7 apportions projected TAF revenues among Tumon Bay Master Plan project expenditures and Ten Year Tourism Plan/Outdoor Recreation Plan project expenditures for the years 1981 through 1990.

TABLE XVI - 7

TAF REVENUES AND EXPENDITURES FOR TUMON BAY MASTER PLAN PROJECTS AND  
TEN-YEAR TOURISM PLAN/PUBLIC RECREATION PROJECTS  
1981 - 1990 \*

| YEAR | PROJECTED<br>TAF<br>REVENUES | EXPENDITURES             |                                                       |                                                       |                                                       |                                                                    |
|------|------------------------------|--------------------------|-------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------|
|      |                              | TUMON BAY<br>MAINTENANCE | PAYMENTS FOR TUMON BAY<br>REVENUE BOND<br>GROUP NO. 1 | PAYMENTS FOR TUMON<br>BAY REVENUE BOND<br>GROUP NO. 2 | PAYMENTS FOR TUMON<br>BAY REVENUE BOND<br>GROUP NO. 3 | TEN YEAR TOURISM<br>PLAN AND OUTDOOR<br>RECREATION PLAN<br>PROJECT |
| 1981 | \$ 1,575,000                 | \$230,000                | \$ 1,000,000                                          | -0-                                                   | -0-                                                   | \$ 345,000                                                         |
| 1982 | 1,650,000                    | 150,000                  | 1,000,000                                             | -0-                                                   | -0-                                                   | 500,000                                                            |
| 1983 | 1,725,000                    | 157,500                  | 1,000,000                                             | -0-                                                   | -0-                                                   | 567,500                                                            |
| 1984 | 1,825,000                    | 165,400                  | 1,000,000                                             | -0-                                                   | -0-                                                   | 659,600                                                            |
| 1985 | 1,900,000                    | 173,700                  | 1,000,000                                             | -0-                                                   | -0-                                                   | 726,300                                                            |
| 1986 | 2,000,000                    | 182,400                  | 1,000,000                                             | 412,500                                               | -0-                                                   | 405,100                                                            |
| 1987 | 2,100,000                    | 191,500                  | 1,000,000                                             | 412,500                                               | -0-                                                   | 496,000                                                            |
| 1988 | 2,225,000                    | 201,100                  | 1,000,000                                             | 412,500                                               | -0-                                                   | 611,400                                                            |
| 1989 | 2,325,000                    | 211,200                  | 1,000,000                                             | 412,500                                               | -0-                                                   | 701,300                                                            |
| 1990 | 2,450,000                    | 221,800                  | 1,000,000                                             | 412,500                                               | \$ 575,000                                            | 462,500                                                            |
|      |                              |                          | through year 2011                                     | through year 2016                                     | through year 2020                                     |                                                                    |

\* in 1981 dollars



## Apportioning TAF Revenues Among Competing Programs

With an understanding of the projected revenues from Table XVI-1 and the projected cost and implementation schedule from Table XVI-2, the use of revenue bonds to fund these projects can be addressed in detail. From the TAF revenues point-of-view, it is impractical to pledge all anticipated revenue against a bond issue for Tumon Bay projects. Too high a value is placed on both the Government's Ten Year Tourism Plan as well as the need for additional islandwide public recreation to totally sacrifice those two programs in behalf of Tumon Bay. On the other hand, however, only the Tumon Bay projects have a direct bearing on economic development, especially through creating employment in the tourism industry and garnering additional revenue for the Government via the TAF and gross receipts taxes. Without a substantial investment from the TAF pledged against revenue bonds for Tumon Bay projects, therefore, the Government can never expect to reap to benefits the expanding economy in tourism. For this reason, it is recommended that, among the three recipients of annual TAF revenues (i. e., Tumon Bay projects, Tourism Plan projects and public recreation projects) that Tumon Bay projects receive a disproportionately large share.

In order to determine exactly how much of the annual TAF should be apportioned to Tumon Bay projects, it is necessary to analyze the recommended projects in terms of their aggregate costs by implementation phase. It is inaccurate to assume that the phased and annual projects summarized in Table XVI-2 can be simply grouped according to priority. Some projects must occur simultaneously, such as all of San Vitores Boulevard, water improvements Phase I, sewer improvements Phase I and a portion of storm drainage facilities, Phase I; while other projects interact in a sequential arrangement, such as the second and third phases of the interior roads, water, sewer and storm drainage improvements.

Another reason to scrutinize the implementation schedule by criteria other than phases is the overall affordability of the projects through a bond issue. Although revenue and special purpose bond packages are a highly technical and complex matter, several generalities help to place the subject in perspective with respect to implementing the Master Plan.

It is reasonably safe to assume that a revenue bond could be floated by pledging proceeds of the Tourist Attraction Fund. These chances would be substantially increased (possibly at a lower interest rate) if the bond were to be backed by the full faith and credit of the Government of Guam. However, inasmuch as this type of backing obligates the Government to annually committing the amount of the bond payment in reserve, it is unlikely that the Government would be willing to offer such support.

Tax-exempt municipal revenue bonds on today's market, unsecured by the local government, would probably carry terms of a thirty year retirement at 12% interest compounded annually on the unpaid balance. For illustrative purposes, these arrangements work out to something like a \$1 million per year payment for 30 years in order to retire an \$8 million bond. Since the TAF is only expected to generate a little more than \$1.5 million in 1981, larger bond issues than \$8 million appear to be beyond the financial capacity of the TAF as now established.

Table XVI - 7 portrays an enormous commitment of funds by the Government of Guam into Tumon Bay. Only when viewed as an investment in the Territory's prime economic breadbasket does this financial obligation become palatable.

Revenue Bond Group No. 4 cannot be started during the next ten years under the financing scheme recommended here. Based on the projected growth rate of hotel rooms and supporting tourists commercial facilities, the Phase III improvements to road, water, sewer and storm drainage facilities can be postponed until the next decade without disrupting the planned development of Tumon Bay.

#### Revenue Bond Implementation

The bonding arrangements should be conducted by the Guam Economic Development Agency which has cognizance over economic development programs for the Territory.

One possible local source for carrying this TAF Revenue Bond is the Government of Guam Retirement Fund. As of December 31, 1980 this Fund held \$103 million of assets in trust for its retirees and members. Since 1975 the rate of growth in assets has averaged 11.4%. Assets held in trust are invested in the U. S. Government and Federal Agency Bonds, corporate bonds and notes, real estate, and corporate stocks. Nearly 20% of the assets are currently invested in U. S. Government Securities and slightly more than 48% are invested in corporate notes and bonds. The average rate of return of all Retirement Fund investments is about 10%; however the more recent rate is approximately 16%.

The second means of financing tourist improvements involves the Federal surplus lands at Harmon Cliffline. Once these properties are turned over to the Government of Guam they can be leased for hotel and resort development (See Chapter XVII, After Tumon). Under such an arrangement the proceeds from these leaseholds can also be pledged against revenue bonds to construct Tumon Bay improvements as well as facilities at the Harmon Cliffline area such as a convention center, a public golf course, a baseball stadium and facilities of a similar nature.

#### B. FINANCIAL CONSIDERATIONS FOR PRIVATE INVESTMENT

Chapter IV presents estimated visitor arrival projections and concluded that between 900 and 2600 additional hotel rooms will be required by 1990. The capital required to add 900 rooms to the Tumon Bay inventory is approximately \$74,000,000. This is based on 150 rooms created by expansion of existing hotels, at \$60,000 per room, and 650 rooms created by construction of new hotels, at \$100,000 per room. The cost of remodeling the existing 100 rooms is not included, as the amount involved is not significant.

To add 2600 rooms, which would be needed by 1990 if the annual growth rate is 10%, would require a total investment of \$254,000,000. Note that these figures are in constant 1981 dollars. Based on the suggested construction schedule, and assuming 10% annual increases in construction costs and that construction costs are all incurred in the twelve months prior to completion, the \$74 million and \$254 million would balloon to \$123 million and \$406 million, respectively. The \$254 million would increase to over \$500 million if the increase in construction costs averaged 15% per year.

Thus, huge sums of money are required to build the additional rooms that increased visitor arrivals will need. This raises two questions. What are the prospects for attracting this capital, and who will provide it? These questions can be answered fairly simply for the capital needed to expand the existing hotels.

In the last year, hotels in Tumon Bay have started to move into the black. As the occupancy rate increases, and prices start going up, the hotels will be increasingly profitable. Because the cost of adding rooms to a hotel is much less than the cost per room of constructing new hotels, it is highly probable that expansions will take place in the next two to three years. Hotel owners will have reason to invest additional money in their hotels.

The construction of new hotels, though, is a far more complex issue. This is best seen by looking at the economics of building a hotel from the point of view of the potential investor. In the first place, hotels have historically not been great investments. It is precisely because investors have been reluctant to build hotels that so many government tourist bodies have been established to encourage this activity. In "Wahab on Tourism Management", (Wahab, Salah, Tourism International Press, London, 1976) the author states that "The reason for such reluctance is that tourist and hotel projects in general do not yield more than 10% - 15% as net return on capital invested. This may not be sufficient for investors who expect to get more return from the same risk, or the same return from less risk." It is due to the poor return on investment that government incentives to stimulate investment in tourist projects are recommended.

The present situation on Guam is also less than promising to a potential investor. Existing hotels have been operating for years, and it is only recently that some have moved into the black. In addition, there has been little or no appreciation in the value of the commercial property in Tumon Bay for six or seven years.

This situation is now changing as occupancy rates increase; it is likely that the situation will continue to improve as occupancy rates go even higher. Occupancy rate increases will have a dual effect: Additional occupants mean additional revenue (without a comparable increase in costs) but they also mean that the hotel operators are given added influence in their price negotiations with the tour operators. It is likely that the combination of these two factors will result in some highly profitable hotels in Tumon Bay in the next few years.

That existing hotels are profitable is encouraging to potential investors. However, this does not necessarily mean that new hotels can be profitable.

A rule of thumb in the hotel industry states that hotel room rates should be equal to the cost of constructing that room, divided by 1000. Thus, a room which costs \$100,000 should have a rack rate of \$100 a day. The rack rate will not be the average room rate due to various discounts that are given to groups, tour operators, travel agents, etc. For a room with a rack rate of \$100, the average rate should be around \$80.

If a hotel is able to average \$80 on its room rate, the hotel should be able to break-even with a 55% occupancy rate, assuming that there are no financing costs. The break-even point with such financing interest charges varies, of course, with the

amount and cost of borrowed funds. Assuming that 65% of the cost of building a new hotel is provided by loans, and that the cost of those loans is only 1% per month, a new hotel would need an occupancy rate of over 80% just to break even.

At present, it would cost around \$100,000 per room to build a new hotel. However, an average room rate of \$80 is completely unrealistic. A new hotel opening today would probably get half to three-quarters of that amount.

The 1% interest charge is also probably too low, although a couple of factors might make it reasonable. One, the current plan by Guam to issue tax-exempt bonds, backed by the guarantee of the developer, could conceivably reduce interest charges to this amount. The going rate in the money market and the financial strength of the developer would determine the cost. Two, it may be possible to get Japanese investors who, because of the much lower cost of money in Japan, can command loans at rates this low or even lower.

Therefore, given the average room rate and the cost of borrowing, the prospects for new hotel construction in Tumon Bay are far from bright.

One hope is that room rates will rise enough in the next few years, and interest rates will fall enough, that hotel construction would again be economically feasible. This is certainly a possibility. Even if occupancy rates remain high, average room rates increase dramatically, and interest rates fall to lower levels, however, it still may be difficult to attract new investment. If this proves to be the case, the most likely cause will be the increasing cost of construction. If construction costs continue to escalate rapidly, additional revenue and lower financing costs may still not be able to make new construction profitable.

An additional consideration, to an investor, is the alternate uses of his money. Even if some combination of room rates, occupancy rates, construction costs, and financing costs results in the likelihood of new hotels being profitable, an investor is still going to compare the amount of the expected return against the returns that can be expected from investments in other areas or other investment vehicles. A 25% return on investment may still be unattractive if a 35% return is available in Hong Kong or Singapore.

#### C. SOURCES OF PRIVATE CAPITAL

The most obvious source of capital for new room construction is the present hotel owners in Tumon Bay. Though they are, at present, more likely to consider expansions of their existing hotels, they are also high on the list of those who might consider new hotel investments. After all, they are already familiar with the market. The Hilton Hotel and Okura have both announced plans to construct an additional 80 and 50 rooms respectively. At an approximate cost of \$60,000 per room, the 130 rooms represent an outlay of \$7,800,000.

The Dai-Ichi, Fujita and Reef Hotels are reportedly interested in expanding, but they have not yet announced any definite plans. There may be some serious constraints because of lack of land area (as in the case of the Reef Hotel) or capital. In any case, their first priority may well be upgrading and renovating their rooms and other facilities.

We might include next to this group local property owners in Tumon Bay, especially those with beach frontage, who might be interested to provide land in a joint-venture.

Another likely type of investor is the foreign airline company which can fly large numbers of passengers in their planes to Guam, such as Japan Airlines which owns the Reef Hotel. A serious future candidate might be Korean Airlines and, of course, All Nippon Airways. As more and more Koreans attain higher income, they will seek to spend their vacations abroad in warmer climates. The country's airline will try to increase its passenger loads and revenues by developing markets in destination areas such as Guam. It will then build a hotel at the end of the line.

Still another group is owners and/or operators of travel/hotel related companies based either in the United States, Asia or the Pacific. It is reported that a large American hotel operator has expressed interest in a hotel investment in Tumon Bay. Similar interest has been reported out of Taiwan and Hong Kong. It is also possible that Japanese companies might be interested, although none have shown any demonstrable interests since the Nagoya interests aborted their plan to build the 523-room Castle hotel in 1975.

The above categories are logical candidates as demonstrated by the pattern existing in Tumon Bay and in many other resort-destination areas. However, they do not include all the possibilities. They may exist in other types of companies or fields of business. They may be in Europe, (Greeks own the Okura Hotel) Latin America or South Asia. In any case, they are a very select group and, more likely than not, Guam will have to find them before they find Guam.

#### D. INCENTIVES FOR PRIVATE INVESTMENTS

Guam offers many attractive investment incentives to persons considering hotel investments. Its weather and environment and its proximity to industrialized, heavily populated, cold weather countries make the long-term future of the island's tourism industry bright. The political and economic stability of the island as well as the existing and planned physical infrastructure are also attractive to potential investors.

In addition to these attractions, escalating construction costs, increased borrowing expenses, and competition with other investment alternatives have encouraged the Government to offer even more incentives to potential investors.

Presently, Guam offers the following incentives.

- 1) A rebate of up to 75% of corporate income tax payable to the Government of Guam, for a period of up to 20 years;
- 2) A rebate of up to 75% on income tax on dividends paid out by the corporation, for a period of up to 5 years.
- 3) Abatement of 100% of the real property taxes, for a period of up to 10 years.

(There are additional tax-saving incentives offered by the Government of Guam, such as abatement of taxes on income from petroleum and alcoholic beverages manufactured on Guam, which are likely to have little or no significance for hotel investors.)



In order to receive a "Qualifying Certificate" entitling them to these tax savings, investors have had to invest a minimum of \$1,000,000. Recently, the Board of Directors of Guam Economic Development Authority adopted a policy which allows the extension of present Qualifying Certificates, or the re-abatement of new Qualifying Certificates, when hotels construct new facilities or expand existing facilities which "generate and/or maintain significant levels of employment."

Another recent development in the incentive structure of Guam's economic development package is the adoption of a strategy to participate in project financing by buying tax-exempt bonds. In this strategy, investors (in a hotel, for instance) would apply to GEDA. If GEDA approves, it will then issue bonds to lenders, with the money thus obtained to be loaned to the hotel investors, who will be responsible for paying the principal and interest on the bonds. Because the bonds are issued by a governmental authority they will be tax-exempt, which will reduce the cost of borrowing the funds. Since the bonds will be guaranteed solely by the investors, the Government of Guam will have no exposure.

The other financial incentive offered to potential investors is that of direct loans or loan guarantees. While investors in a hotel could conceivably benefit from these programs, they do not provide for especially low interest rates, nor is the amount likely to be significant considering the total capital required for hotel construction in the future.

An evaluation of the incentives offered to investors in the past reveals that the incentive package has been structured to reward the hotels for achieving profitability; only the real property tax abatement applies regardless of the hotel's bottom line. In short, once a hotel becomes profitable, the tax incentives make it even more profitable, but while a hotel is losing money the incentives contribute little or nothing.

Ten years ago, this incentive package may have been a good one. However, today's economic situation (construction and financing costs, low room rates, etc.) are such that it may be difficult for investors to foresee even a break-even operation within the decade. Obviously, incentives based on profitability offer little benefit to these investors. Instead, incentives should be those that will shorten the period between start-up and break-even either by reducing expenses or by increasing revenue.

These new incentives might include such things as the following:

- 1) A comprehensive training program, whereby all employees of a hotel would be fully trained by start-up, at no expense to the hotel investors. South Carolina, which has arguably been the most successful state in attracting industry, uses a similar training program incentive as the cornerstone of its efforts.
- 2) Rebate of a portion of the Hotel Occupancy Tax.
- 3) A rebate or abatement of Gross Receipts Taxes paid on purchases by the hotel, especially taxes paid on material and labor used in construction of the hotel and its facilities.

- 4) Provision of financing on better terms. The proposal to issue industrial development bonds is an example of this type of incentive. However, this strategy could be carried even further. The Government of Guam could raise money for a hotel construction loan pool, and loan it directly to investors on terms even better than those which can be obtained with the GEDA proposed industrial development bonds.

Obviously, much study needs to be done to determine the types of incentives, if any, that are required and the cost-effectiveness of each. Should such a study show that additional incentives are required, serious consideration must be given to "customizing" the package for each potential investor. Though it is assumed that all investors have the same long-term objective (i. e., profits), there may be quite different ideas about how to achieve that objective. By customizing the incentive package, each investor could be given the incentives that most appeal to him.

Such an approach might work this way: GEDA would establish guidelines as to the cost that it was willing to accept to encourage additional hotel rooms. This cost could be expressed in \$/room, \$/employee, or some other unit. It would then be possible to determine the total amount of money that would be allowed for any given project. GEDA could then offer the investors a shopping list of possible incentives. The investors could then select the type or types of incentives that they wanted, so long as the total cost of providing the incentives did not exceed the maximum allowable amount.

#### E. RECOMMENDATIONS TO SECURE INVESTMENTS

Four types of recommendations will help to secure the private investments discussed in this Chapter.

- 1) Plan for the addition of 900 hotel rooms by 1990.

The 900 additional rooms is a more realistic target than 2600, though the figures show that a sustained growth rate of 10% in visitor arrivals would require 2600 more rooms. One reason that 900 is more realistic is that the economics of hotel construction is such that it will be difficult to attract enough capital for 900 rooms, much less 2600. A second reason is that a slower planned growth in hotel room inventory will result in more economic stability for the hotel industry in Tumon Bay. This will be an important consideration for potential investors, particularly in light of the losses suffered by the existing hotels in the 1970's. It will not be an easy task to get 900 new hotel rooms built. It will be even more difficult if the investors realize that their 900 rooms may be followed by 1700 more by the end of the decade.

The 900 rooms should be added in stages between 1981 and 1989, even if this results in the loss to Guam's economy of some would-be travellers who can not be accommodated. It's important to reassure investors that every effort will be made to insure economic stability of the industry. To encourage overbuilding of hotel rooms will lead to wild swings in the occupancy rates and make it that much more difficult to raise capital the next time that additions to the hotel room inventory are needed.



This is not to say that more than 900 rooms may not be needed or attainable by 1990. The growth rate in visitor arrivals should be closely monitored and, if double-digit rates are maintained for, say, three more years, then planning for additional rooms will be needed.

2) Attract hotels for different markets

Consider attracting new investors who have the marketing capabilities to bring in visitors from entirely different markets. The difference can be geographic, demographic, or both.

The advantage of this approach is two-fold. One, new hotels could be built without affecting the occupancy rate of the existing hotels. Thus, these rooms could be in addition to the 900 that have already been projected. Two, the economics of building and operating a hotel may be more favorable because of the particular situations of these investors.

For example, an airline that is not now serving Guam could start operating routes for the island and construct a hotel. Korean Airlines, for instance, could begin service, bringing a whole new clientele to Tumon Bay. Since Koreans now make up an insignificant portion of the visitors, the new hotel could conceivably have a very high occupancy rate was insufficient to make the hotel profitable for several years, it still might be profitable for the airline since additional revenue would be generated from airfares, and possibly from other components of the tour package.

While others, such as large travel agencies, tour packages, etc. might also be attracted by this possibility, large airlines would seem the best choice. It will be necessary to identify other potential investors for whom a hotel, thought not profitable by itself, is an integral part of a package of services, the sum total of which will make economic sense to the investor.

In addition to hotels for different geographic markets, the possibility of different demographic markets should also be considered and promoted if the prospects are favorable. It is possible that a luxury resort hotel, catering to upper middle class and upper class travelers as well as business conventions, could do well in Tumon Bay. The Hyatt Regency Maui, for instance, opened two years ago and experienced high occupancy rates almost immediately, using this approach. Given the rising prosperity in Japan, and the number of profitable corporations, it would seem likely that well-conceived promotions would affect enough visitors from this market to justify at least one luxury hotel.

There may be many other demographic markets that are large enough to justify hotels in Tumon Bay catering to them. Studies under the auspices of Guam's Ten-Year Tourism Plan should be undertaken to identify these potential markets and to determine how best to exploit them.

3) Consider the possibility of condominium/hotels

Another way of increasing hotel rooms in Tumon Bay is to build condominiums, sell them to individuals, and use the rooms part-of-the time as hotel rooms. Hawaii, for instance, depends heavily on condo/hotels to accommodate visitors. Without such rooms, many potential visitors would never come to Honolulu or Maui because the number of hotel rooms would not be sufficient to accommodate them all.

Whether such condos would reduce the need for the projected 900 hotel rooms or whether they would result in additional visitors would depend on who uses the condo rooms. If the condos draw visitors from a different market (e. g., persons interested in a much longer vacation of, say, 30 days), then the other hotels would not be significantly affected.

However, the likelihood of attracting new visitors who prefer longer stays is not the only reason for considering condo/hotels. Perhaps the most important reason is that it changes the financial situation. A corporation investing in a new hotel will not be delighted at the prospect of having to put in additional capital, year after year, to cover operating losses and debt service. On a 300-room hotel these additional capital infusions can be very substantial.

A 300-room condo/hotel, on the other hand, is in a different position. There are numerous (perhaps 300) investors bearing the brunt of the capital requirements. Though it is probable that each of them will have to put additional cash in their investment each year, this negative cash flow will be more acceptable to them, for many reasons. It is fair to assume that most of the investors will be financially sound, so the yearly negative cash flows on one condo will not be much of a problem. In return the investor will benefit from some or all of the following.

- a) Personal tax deductions.
- b) The possibility of profits, down the road, as room revenue increases and interest payments decrease.
- c) The probability of capital appreciation as the value of the condo increases.
- d) Use of the condo when desired. This benefit encompasses a number of things, including the right to use the room at any time, even during peak months when hotel accommodations may be unavailable, and the resulting savings in hotel bills. The latter could be particularly relevant if hotel rates rise considerably over a period of years.

Therefore, it is quite possible that what would not make sense as a hotel constructed by a corporation would be very attractive as a condo/hotel to individual investors.

One company already has plans to develop a condominium in Tumon Bay that may be used, in part, as a hotel. The experience of this project should answer many questions about the outlook for condominiums near the beach in Tumon Bay. However, additional studies should be undertaken, particularly to determine the likelihood of marketing such units to the Japanese.

4) Establish a Focus on Tumon Bay Development by GEDA

A separate function of GEDA should be established to plan and implement development programs for the Tumon Bay area. This proposal is born out of the need for better planning and coordination of development efforts in the area. Existing laws and public and private mechanisms have not proven adequate nor capable of facilitating timely and effective development. Because of its compact and fragile environment as well as its great economic importance, proper development in Tumon Bay is even more critical.

Stopping just short of an independent Tumon Bay Development Authority, GEDA should be empowered to plan for the area and to promote the economic development of Tumon Bay by assisting in securing financing for private sector tourism-related enterprises and undertaking the development bonds outlined earlier in this Chapter.

The present GEDA Board could be supplemented by members with a special insight in Tumon Bay development such as the Director of Commerce, President of the Guam Hotel and Restaurant Association, the Manager of the Guam Visitors Bureau and, perhaps, two private sector persons. They would be appointed by the Governor and confirmed by the Legislature.

## CHAPTER XVII

### AFTER TUMON

The land use plan and infrastructure capacity embodied by this Master Plan portend an eventual limit to development in Tumon Bay which is consistent with the preferred image established by the Plan's goals and objectives. This implies that, once its saturation density of another 2000 hotel rooms is reached, Tumon Bay should no longer absorb additional tourist industry development.

The tourism industry on Guam is very likely to grow far in excess of that which is absorbed in Tumon Bay. Therefore, the Government of Guam must be prepared with alternate tourism development areas to take advantage of the continuing demand for the Territory's economic potential as a tourist destination.

A few site selection criteria are paramount to determining areas for future tourist development. Among these criteria are:

- \* Easy accessibility to the beach;
- \* Adequate infrastructure to support hotel demands;
- \* Sufficient land base for sale or long-term lease to developers; and
- \* Close proximity to other tourism industry facilities.

Two sites qualify particularly well under these criteria: the East Agana Bay area and the Harmon Cliffline Area.

#### A. EAST AGANA BAY

This area has been the subject of numerous hotel feasibility studies. It has a particularly beautiful western exposure to the Agana Bay and the Philippine Sea. Infrastructure is conveniently available, especially sewer and water capacity. Its close proximity to the Tamuning/Agana commercial and public attractions offers an added benefit.

Plate XVII - 1 depicts the East Agana Bay area and its proximity to other tourist industry facilities. Approximately 31 acres of land are encompassed, with approximately half undeveloped. This area is presently zoned R-2 (multi-family residential).

Vehicle circulation is very good throughout the area, and the proposed improvement to Marine Drive between Camp Watkins Road intersection and the Paseo in Agana will help alleviate the congestion now caused by commuter traffic. The area is also well served by nearby sewer and water mains, although the sewer collector system and a water distribution system need upgrading to serve any intense development pressures.

The Agana Bay water quality in this area is often plagued by excessive bacterial counts, caused by stormwater discharge from two large storm drains (one Government of Guam and one U. S. Navy) as well as a malfunctioning sewage pump station near Dungca's beach. With the proposed improvements by the Public Utility Agency at the pump station and the ever-tightening stormwater runoff standards, neither of these problems would jeopardize future tourism development.

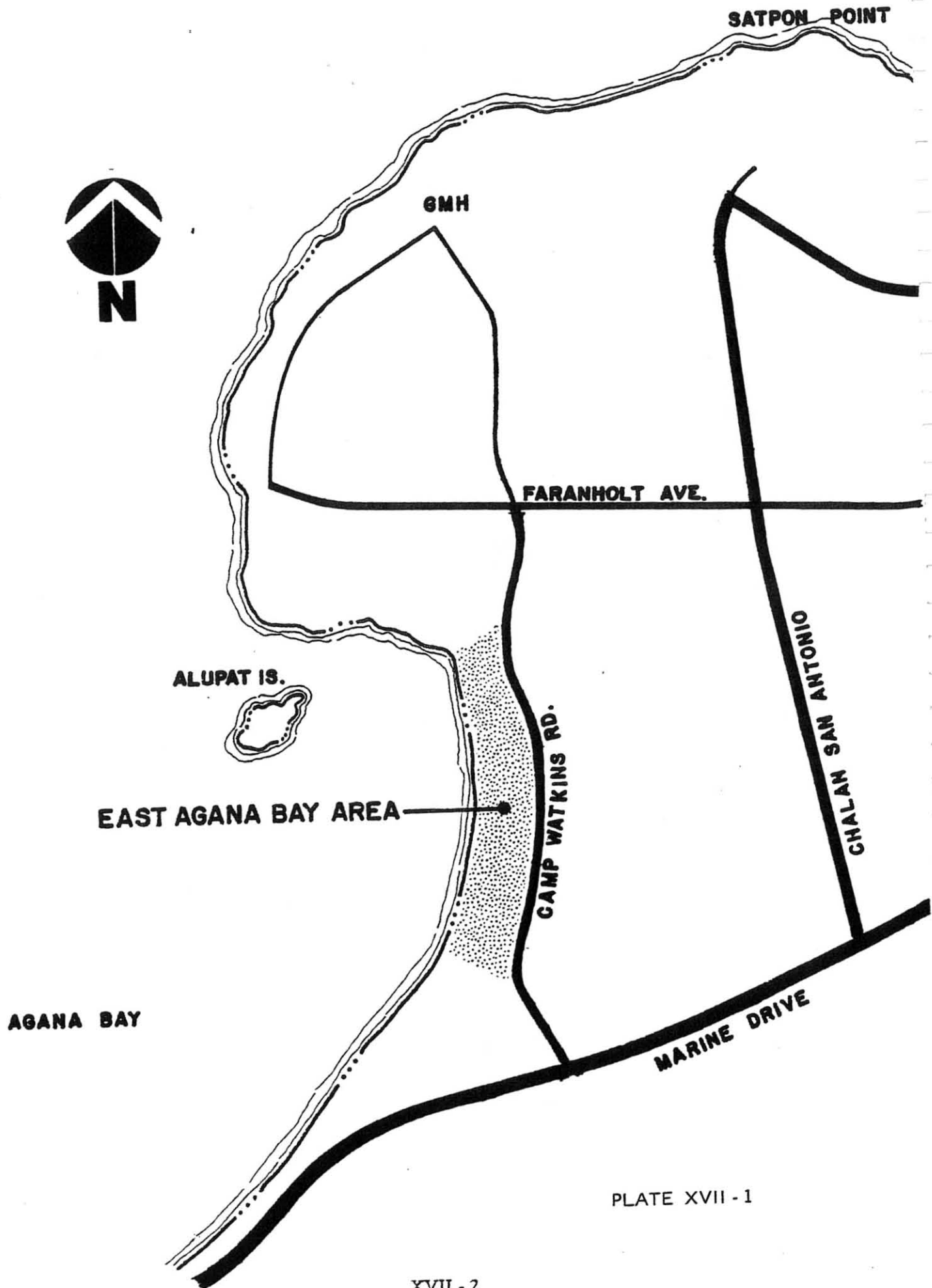


PLATE XVII - 1

**APPENDIX A**

**TUMON BAY  
TOURISM DEVELOPMENT  
FEASIBILITY STUDY**

**Technical Report  
June 1980**

**Department of Commerce  
Government of Guam**

## B. HARMON CLIFFLINE AREA

The Harmon Cliffline area offers a truly unique opportunity for future tourism development on Guam. It is a virtually untouched tract of superbly-situated land that can be totally master planned to reap the highest possible return for Guam's tourist industry.

Except for the Dos Puntan Amantes Overlook and several residential parcels now under lease to the Government of Guam, the area is owned by the Federal Government and administered by the U.S. Air Force. However, the entire tract has been declared as releasable by local military commands and may be declared surplus to the Federal Government. In that event the local Government could assume ownership. Obviously, the Government of Guam is besieged with proposals for the ultimate use of this property, and it falls to the Bureau of Planning and the Central Planning Council to determine the eventual recommended use.

Plate XVII-2 displays the Harmon Cliffline area and shows the land to be released to the local government as well as its proximity to Tumon Bay. Approximately 209 acres are available, although not all of this land need be designated for future tourism development.

Infrastructure capacity is good at this site. The Northern District Sewer System Treatment Plant sits in the northern part of the area. The lack of a water distribution system reflects the area's recent sparse use; however, a main is nearby at Marine Drive. The existing circulation system is virtually expendable and can be replanned to support the future use of the area. Both power and telephone utilities are also available along Marine Drive.

This area's easy accessibility to the water is denied by a 300-foot difference in elevation between the plateau and the ocean. However, access can be developed to Bijia Beach and Fafai Beach if carefully planned and constructed. At any rate, this tract's vertical dislocation from the beach does not deter from Harmon's overall attractiveness as a future tourist destination.

Until Tumon Bay has reached its saturation density of development, the Harmon Cliffline area to be reserved for future tourism expansion should be held in public domain. An important element of timing comes into play wherein the Harmon Cliffline area should become available for lease to private investors (complete with adequate support infrastructure) at a time approximating the saturation point of Tumon Bay. In this way the Government's investment in Tumon Bay will not be under utilized because hotels are being attracted to other locations, nor will development pressures beyond those intended for Tumon Bay exert themselves because of no alternative sites.

Until the time that Harmon Cliffline land is ready for hotel and resort investment, it can be utilized as a public park and open space recreation area. The critical component of this approach relies on a land use master plan for Harmon Cliffline that designates the various future uses in order to make development decisions for the lands within and peripheral to the reserved tourist industry area.



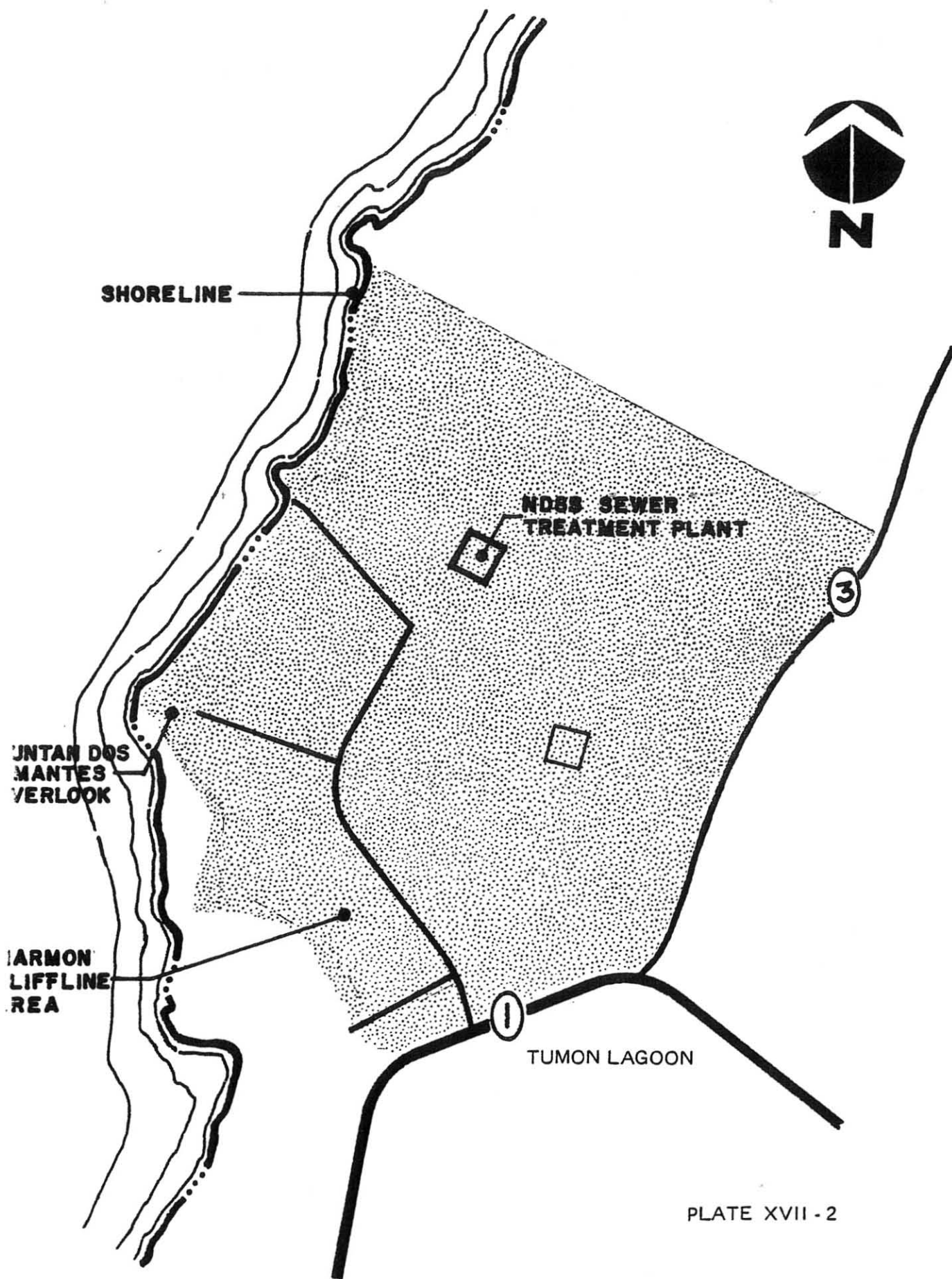


PLATE XVII - 2

Surely the biggest threat to the inherent potential of the Harmon Cliffline area is failure to master plan the area for the most beneficial use of Guam's future. Unless the presently competing demands are carefully synthesized into a final master plan that is eventually adopted, the land will fall prey to incremental, disjointed development decisions. A land use master plan for the Harmon Cliffline area is very important and should allocate a substantial portion of the area for future tourism development.

#### C. TIMETABLE FOR USING ALTERNATE SITES

It should be noted that no schedule has been suggested for utilizing these alternate sites to absorb tourist related development after Tumon Bay. The actual transition will depend on Tumon's growth rate and its approach to the limit of planned infrastructure capacity. The saturation point may occur in five years or twenty five years, but sometime between 1990 and 2000 is probable. Therefore, it is not too soon to take certain steps at this time in anticipation of tourist industry development at both East Agana Bay and at Harmon Cliffline within the next ten years. These steps are listed below.

- \* Proceed with the proposed sewer system improvements at the Dungca's pump station, near Camp Watkins Road, to eliminate that source of Agana Bay pollution.
- \* Enforce compliance with water quality standards for stormwater discharge into the Agana Bay, or plan alternate disposal methods to eliminate these sources of Agana Bay pollution.
- \* Prepare a Land Use Master Plan for the East Agana Bay area, reflecting the area's tourist industry potential.
- \* Prepare a Land Use Master Plan for the lands to be released at the Harmon Cliffline, allocating a substantial portion of the area for future tourism development.

NOTE:

This study was accomplished under a grant from the Economic Development Administration. The statements, findings, recommendations, and other data in this report are solely those of the Grantee and do not necessarily reflect the views of the Economic Development Administration. The material is the result of tax-support research and as such is not copyrightable. It may be freely reprinted with the customary crediting of the source.

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- Department of Land Management
- Guam Visitors Bureau
- Public Utility Agency of Guam
- Guam Power Authority
- Chamber of Commerce

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## SECTION I

### STUDY OBJECTIVES

The objectives of the Tumon Bay Tourism Development Feasibility Study are fourfold.

1. To prepare a reproducible planimetric base map at 1" = 200' scale for the study area.
2. To analyze the Tumon infrastructure on a demand versus capacity basis.
3. To determine the potential for additional development in the Tumon Bay area.
4. To develop a data base for Phase I of the Government's proposed Tumon Bay Master Plan.

The graphical presentations that support this Technical Report are a Base Map and five transparent Overlays (42" x 72" in dimension), entitled:

|                                     |   |              |
|-------------------------------------|---|--------------|
| Circulation and Public Lands        | - | Sheet 1 of 6 |
| Zoning, Property and Slope Analysis | - | Sheet 2 of 6 |
| Water and Sewer                     | - | Sheet 3 of 6 |
| Power and Communications            | - | Sheet 4 of 6 |
| Demand/Capacity Analysis            | - | Sheet 5 of 6 |
| Base Map                            | - | Sheet 6 of 6 |

Reduced-size versions of those graphics are also enclosed with this report and intended to be used as references.



**TABLE I**  
**POPULATION IN TUMON BAY STUDY AREA**

|                                                 | Number | Dwelling Units | Average People<br>Per Unit | Total        |
|-------------------------------------------------|--------|----------------|----------------------------|--------------|
| Single-Family<br>Residences                     | 229    | 229            | 179 @ 4.8<br>50 @ 2*       | 960          |
| Apartment<br>Buildings                          | 44     | 595            | 3.0                        | 1,785        |
| Hotels                                          | 10     | 1,917          | 3.0                        | 5,751        |
| <b>ESTIMATED TOTAL POPULATION IN STUDY AREA</b> |        |                |                            | <b>8,496</b> |

\*50 Dwelling Units at Guma Tranquilidat, a new housing project for senior citizens, are projected at 2.0 occupants per unit.

## SECTION II

### STUDY AREA

This study pertains to the Tumon Bay area, generally defined by Fafai Beach (commonly called Gun Beach) to the north, Marine Drive to the east, Hospital Point to the south and the Tumon Bay Reef Line to the west. Excluding the precipitous slope which meanders from north to south, the study area contains approximately 479.6 acres of generally level land. The enclosed Base Map portrays this study area.

The existing development is evenly distributed throughout most of this area with pockets of high-density population at seven (soon to be eight) large hotels and five large apartment complexes. Two places nearly devoid of development are the Naton Beach area and the Fafai Beach area.

As of December 1979, Tumon Bay development included 10 hotels, 28 commercial establishments, 44 apartments and 121 single family residences, 2 churches, and 1 school<sup>1</sup>.

Census statistics are not yet available for the area. However, with a few logical assumptions a reliable interpretation can be drawn from the inventory of buildings and other demographic data available for Guam. These assumptions are:

- 1) That the average single family residence (not including apartments) on Guam houses 4.8 people.
- 2) That apartment units house an average of 3.0 people.
- 3) That all single family residences and apartment units in the Tumon Bay area are fully occupied.
- 4) That hotel rooms are essentially full to capacity and serve an average of 3.0 tourists per room.

The study area census is then derived in Table I.

### SECTION III

#### STUDY METHODOLOGY

##### A. Accomplishment of Study Objectives

The four study objectives were accomplished through the following methodology -

###### For Objective No. 1

From government-furnished 1975 aerial photos of the Tumon Bay area a plane-metric map was traced at 1" = 400' scale. After upgrading the study area's development to December 1979 conditions, this map was enlarged to 1" = 200' scale on reproducible mylar. Graphics, a legend and title block data were then added.

This mylar is easily updated by simple pen and ink or erasures so that the Government can always have a reproducible and current base map of the Tumon Bay area at 1" = 200' scale.

###### For Objective No. 2

The following infrastructure and other features were analyzed using government furnished maps, plans and reference documents:

- Water
- Sewer
- Power
- Telephone
- Roadways
- Property boundaries
- Zoning

Demand and capacity was specifically analyzed for water, sewer, power, telephone and land base by calculating the actual demand generated by existing development versus the existing capacity available in the study area.

The enclosed plates entitled, "Circulation and Public Lands", "Zoning, Property and Slope Analysis", "Water and Sewer", and "Power and Communications" graphically depict these demand/capacity profiles.

###### For Objective No. 3

After determining the demand/capacity profile for water, sewer, power, telephone and land, certain "excess capacity" was identified for the study area. This excess could conceivably absorb future development and, therefore, is a measurement of the study area's potential for development, within limits of the existing infrastructure.

In order to define the extent of additional development that could be absorbed where excess capacities were identified, however, a theoretical demand by future development must be established. For this purpose, two example developments were identified: a 200-room hotel and a 50-unit apartment/condominium complex. Each of these model developments were assigned a theoretical demand for water, sewer, power, telephone and land requirements. These future demands were scaled against the excess capacities in order to quantify the development potential of the study area. This procedure is outlined and graphically presented in Section VI of this Report.

#### For Objective No. 4

A current data base for the physical features and infrastructure of Tumon Bay was generated during the course of achieving the first three objectives and is collectively contained in the Base Map, Overlays, enclosed Plates and this Report. This data was corroborated by other recent data collection efforts in that area, especially those cited in the List of References at the conclusion of this Technical Report.

Surely, one of the most valuable aspects of this data base for planning in Tumon Bay lies in the utility and flexibility of the reproducible Base Map and its accompanying five Overlays. These planning tools were expressly designed for ease in mapping, updating, analyzing and planning throughout the study area. With regular attention given to their currentness, the entire set will serve the Government's Tumon Bay planning activities for many years.

#### B. Service Zones

In order to facilitate the demand/capacity analyses, the Study Area is subdivided into nine service zones, labeled A through I and outlined on the Base Map. These service zones were established with regard to homogeneity of development intensity. The nine service zones embrace the following portions of the study area.

##### Service Zone A

Hilton Hotel, Pacific Islands Village, Perez Apartments and Ypao Beach Park. This zone occupies the southwesternmost end of the Study Area and is generally oriented around the island's most popular public beach and passive recreation area. The residential and resort development is almost exclusively two or more stories in height. The central location and openness of Ypao Beach Park creates an important and refreshing break in this zone's development pattern.

##### Service Zone B

Continental Hotel, Guma Tranquilidat, Vacant Government Land. In comparison to service zone A, this zone is all low-profile development, with clustered structures of only one story in height. Nearly half of the area is in government ownership, which virtually assures this low intensity character for a long time.

#### Service Zone C

Dai-Ichi and Dai-Ichi Annex, Suehiro, Fujita, Several Apartment Complexes. This is a centrally-located pocket of the Study Area's highest population density. The zone is nearly saturated with development and exerts a concentrated demand on all supporting infrastructure. It is also the topographically low-point of the study area and, therefore, particularly important in the context of sewer flows, storm drainage and flooding.

#### Service Zone D

Naton Beach, Bay View Apartments, Large Tracts of Undeveloped Privately-owned Land. This zone is relatively untouched by development and, as such, possesses a unique personality within the Study Area. It is certainly an early target for future development pressures in the Tumon Bay area.

#### Service Zone E

Reef Hotel, Okura Hotel. This zone occupies the topographically highest developable beachfront land along Tumon Bay and is relatively saturated by the two large hotels and adjacent commercial/residential structures.

#### Service Zone F

Fafai Beach, Large Tracts of Undeveloped Privately-owned Land. This large zone is virtually untouched by development and includes the entire northern extremity of the Study Area. It is a popular site for beach and ocean recreation despite not having any infrastructure except a coral access road. As with zone D, this zone is constantly subjected to development pressure.

#### Service Zone G

Inland from Pale San Vitores between Tumon Loop Road and Duggan's Gulch, Tumon View Apartments, Joinus Hotel. This large zone is well defined by roadways on three sides and the Tumon Cliffline along its eastern exposure. With the Joinus Hotel and a few commercial establishments as exception, the area is exclusively residential, mostly apartment complexes. The higher tracts of this zone command a good view of the Tumon Bay area.

#### Service Zone H

Inland of Pale San Vitores between Tumon Road and Duggan's Gulch, Residential. Zone H is also bounded by roadways and the Tumon Cliffline. It is exclusively a residential zone, with the number of single-family units and apartment complexes nearly in balance. The entire area is fairly accessible and also commands a good view of Tumon Bay.

#### Service Zone I

Shoreside adjacent to Marine Drive, St. John's Episcopal Church, Pacifica Apartments, Ocean View Apartments. This area is a strip between Marine Drive and the upper Tumon Cliffline. Except for its close proximity to the Tumon Cliffline, it is not related to the study area in terms of infrastructure, zoning or development pressures. Zone I, therefore, is not included in the remainder of this study's work.

### C. Population by Service Zones

A common denominator for technical analysis of infrastructure within each service zone is the population (resident and tourist) that resides in each zone. These statistics are derived by allocating people per dwelling unit as assumed in Section II and Table I.

Table II portrays service zone population.

**TABLE II**  
**RESIDENT AND TOURIST POPULATION IN EACH SERVICE ZONE**

| SERVICE ZONE | SINGLE FAMILY<br>DWELLING UNITS(+)<br>x 4.8<br>(Except Zone B) | APARTMENT<br>DWELLING UNITS(+)<br>x 3.0 | HOTEL ROOMS =<br>x 3.0 | TOTAL<br>POPULATION |
|--------------|----------------------------------------------------------------|-----------------------------------------|------------------------|---------------------|
| A            | 36 x 4.8                                                       | 78 x 3                                  | 493 x 3                | 1,886               |
| B            | 50 x 2                                                         | -0-                                     | 182 x 3                | 646                 |
| C            | 20 x 4.8                                                       | 105 x 3                                 | 680 x 3                | 2,751               |
| D            | 2 x 4.8                                                        | 50 x 3                                  | -0-                    | 160                 |
| E            | 4 x 4.8                                                        | -0-                                     | 526 x 3                | 1,596               |
| F            | 1 x 4.8                                                        | -0-                                     | -0-                    | 5                   |
| G            | 60 x 4.8                                                       | 187 x 3                                 | 36 x 3                 | 956                 |
| H            | 56 x 4.8                                                       | 75 x 3                                  | -0-                    | 493                 |
| TOTAL        | 179 x 4.8<br>50 x 2.0                                          | 595 x 3                                 | 1917 x 3               | 8,493*              |

\* Column summation differs by 3 from Total Population in Table I due to rounding-off row calculations involving the 4.8 factor for residents/dwelling unit.

## SECTION IV

### DEMAND/CAPACITY ANALYSIS OF LAND BASE AND INFRASTRUCTURE

#### A. Land Base

The analysis of demand on land and capacity of land throughout the study area was calculated on an acreage basis. Demand on land is defined as acres presently committed to development: residential, commercial hotel/resort, public recreation, or public right-of-way. Unimproved government land, as depicted in the Plate, "Circulation and Public Lands", is treated as committed land base and, therefore, reflected as bonafide demand. Property boundaries as shown on the plate, "Zoning, Property and Slope Analysis", were followed to calculate developed land acreage, except where a structure occupies only a small portion of otherwise vacant property and future parcelling appears likely.

The capacity analysis reflects total acreage of each service zone and, cumulatively, of the entire study area. Two important criteria for determining land capacity are the use of the mean high water line for the Bay side boundary and the toe of the slope for the inland boundary of the study area.

The demand/capacity of land as depicted on the "Zoning, Property and Slope Analysis" Plate is summarized below in Table III.

TABLE III LAND BASE ANALYSIS

| Service Zone | Demand<br>In Acres Developed | Capacity<br>In Total Acres | Undeveloped Acres |
|--------------|------------------------------|----------------------------|-------------------|
| A            | 61.2                         | 64.4                       | 3.2               |
| B            | 45.1                         | 57.1                       | 12.0              |
| C            | 38.5                         | 43.6                       | 5.1               |
| D            | 8.1                          | 50.4                       | 42.3              |
| E            | 21.4                         | 27.2                       | 5.8               |
| F            | 1.1                          | 69.5                       | 68.4              |
| G            | 52.6                         | 93.3                       | 40.7              |
| H            | 45.5                         | 74.1                       | 28.6              |
| TOTAL        | 273.5                        | 479.6                      | 206.1             |



## B. Water System

### General

The capacity and demand of the water system of the study area is analyzed according to the following operational aspects:

#### Overall System

#### Supply and Consumption

#### Pressure

#### Pipe Systems

#### Firefighting Capability

Occasional references are made to the Water Facilities Master Plan<sup>3</sup> prepared for the Public Utility Agency of Guam and the Guam Environmental Protection Agency. The entire study area is included in Regional Water Service Area "B" as outlined in the Plan. Service zone A of the study area is part of the Tamuning Water System. Service zones B thru F are part of the Tumon Water System.

#### Overall System

Regional Water Service Area "B" as outlined in the Water Facilities Master Plan, serves the villages of Asan, Piti, Agana Heights, Sinajana, Chalan Pago-Ordot, Mong-mong-Toto-Maite, Mangilao, Barrigada and Tamuning and supplies the vast majority of Guam's population. With the exception of the Asan-Piti area, the water systems serving all the villages are integrated and operate as one system which utilizes several pressure zones.

The water systems serving Tamuning and Tumon are interconnected with the Dededo System. The Dededo Ground Reservoir (O.F. Elev. \* @ 386') and the Barrigada Reservoir (O.F. Elev. @ 498') serve as the regulating reservoirs through different transmission lines. They, in turn, are filled from the "D" series of water production wells. A large percentage of Tamuning's and Tumon's water is supplied from this source. The remainder comes from the "A" series and the "M" series water production wells, via the Agana Heights Reservoir (O.F. Elev. @ 236').

A 14-inch diameter water main conveys water from the Dededo Ground Reservoir to the 10 mg Tumon Reservoir (O. F. Elev. @ 236') located on Route 10A near the Guam International Air Terminal. The Tumon Reservoir is the only storage facility

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\*Overflow elevation which means the highest elevation. Thus water may ascent in a tank without overflowing. This figure is used occasionally to determine the pressure zone.

serving the Tamuning/Tumon area, although in an emergency or low water-level condition, the Agana Heights Reservoir will also serve the Tamuning/Tumon area because it is located at the same elevation as the Tumon Reservoir. The Tumon Reservoir, however, may not always be functioning as the prime regulating storage since the Dededo Ground Reservoir overshadows it from a hydraulic standpoint.

The 1.0 mg Tumon Loop Reservoir (O. F. Elev. @ 253') located 1/4 mile northeast of St. John's Church, but on the opposite side of Marine Drive, was constructed in 1976 for the purpose of providing storage to serve the lower Tumon area. The reservoir has not been connected to the PUAG water distribution system, although this hook up is planned for implementation soon.

The water system in the lower Tumon area along San Vitores Road is currently fed from two connections. One connection is at a pressure regulator (PRV) located below the intersection of the San Vitores Road and Marine Drive adjacent to the Cliffline. This regulator is fed from the Dededo System thru the Barrigada Reservoir, which acts as the regulating reservoir. The water is delivered to the lower Tumon area through an 8-inch and 12-inch diameter water main which traverses Ligan Terrace.

The other connection is located at the intersection of San Vitores Road and Tumon Road. However, a pressure regulator located at this connection is not operating.

In summary, both the Tamuning and Tumon Systems are being served by four storage reservoirs at three different elevations: Barrigada at 498', Dededo Ground Reservoir at 386'; and Tumon and Agana Heights at 236'. Consequently, the PRV is presently ineffective. This mode of operation is not desirable because it reduces the effectiveness of the Tumon Reservoir and renders the water system hydraulics and control somewhat unpredictable. A better arrangement is to serve the Tamuning area from a single pressure zone with hydraulic control from the Tumon Reservoir, with a back-up connection to the Dededo Reservoir through a pressure regulator.

#### Demand and Supply

As stated, the Tamuning and Tumon Systems gets water from the "D" series wells in Dededo through the Dededo Ground Reservoir which acts as the regulating storage and from the "A" series and "M" series Ordod-Chalan Pago and Mangilao areas wells through the Agana Heights Reservoir as the regulating storage. There are 45 wells producing 17.23 mgd for Tamuning as well as for the Agana, Mangilao, Ordod, Chalan Pago and Dededo areas. The Tumon area is likewise served by the Dededo wells through the Barrigada Reservoir.

Water consumption is a function of land use and census. In the case of the Tumon Bay study area, the predominate land uses of resort and residential are similar in water use characteristics. The Water Facilities Master Plan cites a 1980 projected water consumption of 145 gallons per capita per day for the Tamuning/Tumon area. When applied to the resident population of each service zone, this calculation yields a reliable water demand in gallons per day.

For the tourist population, however, a slightly different approach is necessary. Tourists on Guam are more mobile, generally speaking, than residents of Tumon. Their water demand, therefore, is more distributed throughout the island, especially to shopping centers, public parks and the Cocos Island area. Additionally, tourists do not generate all of the typical water uses of residents such as for laundry, car washing, irrigation, etc. For the purpose of this study, therefore, tourists have been assigned a water use factor of 80% of the resident population, or about 116 gallons

By counting the hotel rooms, single family residences and apartment dwelling units in each service zone the census and water demand can be calculated. This is presented in Table IV.

TABLE IV  
WATER CONSUMPTION BY SERVICE ZONE

| ZONE  | RESIDENTS X 145 + TOURISTS X 116 = |   |     |   |      |   | GALLONS PER DAY |
|-------|------------------------------------|---|-----|---|------|---|-----------------|
| A     | 401                                | X | 145 | + | 1479 | X | 116 = 229,500   |
| B     | 100                                | X | 145 | + | 546  | X | 116 = 78,000    |
| C     | 711                                | X | 145 | + | 2040 | X | 116 = 340,000   |
| D     | 160                                | X | 145 | + | Zero |   | = 23,000        |
| E     | 48                                 | X | 145 | + | 1548 | X | 116 = 186,500   |
| F     | 5                                  | X | 145 | + | Zero |   | = 500           |
| G     | 845                                | X | 145 | + | 108  | X | 116 = 135,000   |
| H     | 493                                | X | 145 | + | Zero |   | = 71,500        |
| TOTAL |                                    |   |     |   |      |   | 1,064,000       |

To compute the daily capacity (well production) for the Regional Water Service Area "A" and "B", the population distribution between both Regional Service Areas and the Study Area is estimated; and then the supply storage to the study area can be apportioned accordingly. This tabulation is contained in the following Table and concludes that approximately 1.8 million gallons of water per day are available to the Tumon Bay Study Area.

**TABLE V**  
**WATER CAPACITY DETERMINATION BY**  
**APPORTIONMENT OF STUDY AREA POPULATION TO REGIONAL**  
**WATER SUPPLY AND POPULATION**

|                                               | POPULATION<br>(NEAREST HUNDRED) | AVERAGE WATER<br>PRODUCTION AVAILABILITY<br>IN MGD |
|-----------------------------------------------|---------------------------------|----------------------------------------------------|
| Regional<br>Service Area A<br>(Dededo & Yigo) | 31,600                          | 4.33    Production                                 |
| Regional<br>Service Area B                    | 51,900                          | 12.90    Production                                |
| TOTAL                                         | 83,500                          | 17.23    Production                                |
| STUDY AREA                                    | 8,500                           | Zero    Production                                 |
| Proportion of<br>Study Area<br>To Total       | 10.2%                           | say    1.757<br>1.8    Available                   |

Based on the above analysis, there is sufficient water available to the study area if overall production is considered. However, storage analysis paints a different picture.

The demand (consumption) and capacity (supply and storage) of water must be analyzed on a regional basis, since Tumon does not produce its own water.

As stated in the Water Facilities Master Plan, adequate storage within a specific service zone is available to handle the daily consumption. The only storage reservoir serving the area presently is Tumon Reservoir, although this reservoir is "overshadowed" hydraulically by the higher Dededo Ground Reservoir. The standard system design practice is to consider the lower third of the tank as unavailable for daily consumption. This part of the storage (333,000 gals out of 1,000,000 gallon tank) is generally reserved for firefighting purposes. So even if the Tumon Reservoir is hydraulically functional, it does not have enough storage (the remaining 667,000 gallons) to supply the daily demand of the study area without the capacity provided by the Dededo Reservoir. If the Tumon Loop Reservoir is activated, however, another 667,000 gallons there will be added, yielding a total of 1.34 mg available to handle the existing daily consumption.

#### Pressures

The Water Facilities Master Plan recommends that each system maintain between 50 - 80 psi throughout and a minimum of 20 psi residual at the most isolated hydrant location for fire fighting purposes.

An inspection in March 1980 of the functioning PRV, along northern San Vitores Road, revealed that the pressure gages on the low and high sides of the regulator were registering 50 psi. The regulator is located at elevation 120'. This amounts to a hydraulic gradient of 235.5'.

This fact can be translated into useful information. First, those buildings located at or near elevation zero are experiencing pressures in excess of 100 psi, at least on the ground floor. Second, that the system is probably serving areas up to elevation 190' with residual pressures around 20 psi. Third, the available pressure can service a building 20 stories high if built at an elevation of mean sea level.

The elevations of the service areas are shown below in Table VI together with available pressures.

TABLE VI

#### SERVICE ZONE ELEVATIONS AND AVAILABLE WATER PRESSURES

| SERVICE ZONE | RANGE OF GROUND ELEVATIONS ABOVE MSL | ASSUMED AVAILABLE PRESSURES IN PSI* |
|--------------|--------------------------------------|-------------------------------------|
| A            | 0 - 70                               | 72 - 100                            |
| B            | 0 - 70                               | 72 - 100                            |
| C            | 0 - 20                               | 93 - 100                            |
| D            | 0 - 15                               | 95 - 100                            |
| E            | 0 - 87                               | 64 - 100                            |
| F            | 0 - 150                              | 37 - 95                             |
| G            | 20 - 100                             | 50 - 93                             |
| H            | 20 - 100                             | 50 - 93                             |

\* The computations for the high and low pressures for Service Zones A thru H were based on the 50 psi reading taken at the Pressure Regulator.

Subsequent to these calculations pressure readings were also conducted in the field. The results of these readings verify the accuracy of the former assumptions and are recorded in the following Table.

**TABLE VII**  
**VERIFICATION OF WATER PRESSURE WITHIN SERVICE ZONES**

| LOCATION                              | ELEVATION<br>OF BIB ABOVE<br>MSL | PRESSURE<br>IN PSI |
|---------------------------------------|----------------------------------|--------------------|
| Hilton Hotel<br>(Service Zone A)      | 35                               | 100                |
| Ypao Park<br>(Service Zone A)         | 10                               | 110                |
| Continental Hotel<br>(Service Zone B) | 55                               | 90                 |
| Guma Tranquilidat<br>(Service Zone B) | 40                               | 95                 |
| Dai-Ichi Annex<br>(Service Zone C)    | 15                               | 100                |
| Fujita Hotel<br>(Service Zone C)      | 10                               | 100                |
| Reef Hotel<br>(Service Zone E)        | 60                               | 85                 |
| Okura Hotel<br>(Service Zone E)       | 70                               | 80                 |

#### Pipe Systems

The Tamuning distribution system is a random mixture of recently constructed and older water mains. Many of the old mains are located on private property, sometimes located beneath buildings. Many were constructed to serve dwellings and commercial buildings that are no longer in existence. PUAG records do not indicate whether these lines were left in service or abandoned. The potential for water losses from older metallic mains is high.

Service zones A and a portion of B (areas being serviced by the Tamuning System) have a 12-inch line servicing the areas. This is considered as hydraulically adequate. The type and age of this line are unknown; therefore, no judgment can be made about its condition.

The Tumon System has serious deficiencies in its piping system. The distribution line on San Vitores Road consists of a 6-inch and a 4-inch diameter pipe. The exact point where the 6-inch begins and ends and the length of the 4-inch line is unknown. However, no mainline should be constructed out of 4-inch or smaller size pipes, especially where fire hydrants are located. Even 6-inch lines are inadequate for multi-story high value buildings.

#### Fire Fighting Capability

According to design criteria in the Water Facilities Master Plan, the fire flow should be 3,500 gpm for a minimum of 3 hours. This requires a fire storage of 630,000 gallons. The Tumon Reservoir by itself does not provide adequate fire storage (unless the entire reservoir is considered as fire storage). The addition of the Tumon Loop Reservoir would help meet the study area's needed fire storage, as well as the daily consumption. The Tumon and the Tumon Loop Reservoir each would have 333,000 gallons storage set aside for fire.

Another related design criteria states that a hydrant should cover 100,000 square feet for high value districts. This covers a hypothetical area of 170' radius. Therefore, for an area to have proper firefighting protection the hydrants should be spaced every 180' - 200'. Based on this criteria there should be about 200 hydrants throughout the entire study area when fully developed. Considering the fact that only about 60% of the area is developed to any extent, at least 120 hydrants should be installed and functioning at this time. During field investigation only 22 hydrants were discovered, including several not shown on the Water Facilities Master Plan System.

The demand and capacity for both daily consumption and fire flow storage are depicted on the "Water and Sewer" Plate and summarized in Table VIII.



TABLE VIII

DEMAND FOR WATER CONSUMPTION AND FIRE FLOW VERSUS CAPACITY  
IN MGD BY SERVICE ZONES

| SERVICE ZONES | DEMAND FOR CONSUMPTION | DEMAND FOR FIRE FLOW | CAPACITY IN MGD |
|---------------|------------------------|----------------------|-----------------|
| A             | .2295                  | .136                 | .393            |
| B             | .0780                  | .046                 | .134            |
| C             | .3400                  | .201                 | .582            |
| D             | .0230                  | .013                 | .039            |
| E             | .1865                  | .110                 | .319            |
| F             | .0005                  | .011                 | .001            |
| G             | .1350                  | .080                 | .231            |
| H             | .0715                  | .042                 | .122            |

The full potential for tourism development in Tumon Bay, therefore, is thwarted by the existing water system in two ways. First, fire flow storage capacity is insufficient to meet accepted safety codes throughout the Tumon Bay area. Second, several water mains are too small to supply both fire fighting and daily consumption demands. While plans and designs are available to alleviate both deficiencies, they pose a serious and immediate threat to additional development in the Tumon Bay area.

## C. SANITARY SEWER SYSTEM

## General

In the water supply analysis, total daily consumption within the study area was calculated as 1.064 mg. For sewer system analysis we use the water demand and apply three assumptions:

1. That all structures are connected to the sewer system. This is not an existing condition, per se, but a development objective that will be realized eventually.
2. That a 10% loss of water is due to leakage and other non-sewered water uses such as landscaping irrigation and other outdoors water consumption.
3. That sewage holding tanks are not in use at hotels and other developments.

The sanitary sewer infrastructure within this study area should be analyzed from two points: the collection and transmission system and that system's pumps and lift stations. Analysis of the treatment is unnecessary because all sewer flows from the study area are treated by the Agana Sewage Treatment Plant which is operating well within its design specifications.

## Collection and Transmission System

The collection and transmission system is depicted on the enclosed Plate, "Water and Sewer".

The gravity lines serving the study area consist of the following:

### Line A - San Vitores Road

Continental Hotel to intersection of San Vitores and Tumon Road (8 inch)  
From intersection of San Vitores and Tumon Road to Tumon Bay Lift Station  
located at the intersection of the Fujita Hotel Road and San Vitores (10 inch)

### Line B - San Vitores Road

From Reef Hotel to Tumon Bay Lift Station (10 inch)

### Line C

From Beach Side of Fujita Hotel to Tumon Bay Lift Station (8 inch)

### Line D

From below St. John's Church to Line B (6 & 8 inches)

### Line E

From Tumon View Apartments to Line B (8 inch)

### Line F

From main entrance of Ypao Beach Park to Ypao Lift Station (8 inch)

The extent of lateral connections to these sewer lines are not a part of this study.

The force mains serving the area are:

- A. From Tumon Bay Lift Station to Marine Drive along Duggan's Gulch Road (8 inch)
- B. From Ypao Lift Station between Ypao Beach Park and the Hilton Hotel (6 inch)
- C. From the Okura Hotel to the beginning of Gravity Line B.

The only potentially critical section of the transmission system is the 10-inch diameter pipe on Line A from St. William's Church to the Tumon Lift Station. This section is built on relatively level land. Hydraulically, the 10-inch diameter line on minimum design slope of .0029 feet per foot can carry up to 524 gpm. The contributing service zones for this line are B, C, and a portion of H. Assumed that these three zones are fully sewered, the amount of average sewage flow is 339 gpm, less than the line capacity. Peak flows, however, are likely to cause overloads.

Although the 6-inch pipes in Line D are not considered critical, it should be noted that GEPA's standards call for a minimum of 8-inch pipes for collector lines. These 6-inch lines are not yet critical because they are constructed on relatively steep slopes. In the very near future, however, they should be analyzed in greater detail to determine their actual carrying capacity in conjunction with any anticipated increase in the sewage load.

#### Lift Stations and Pumps

There are two sewage lift stations that serve the study area:

- 1) The Tumon Bay Lift Station serving Service Zones B thru F, with a pump capacity of 700 gpm; and
- 2) The Ypao Lift Station serving Service Zone A, in addition to other areas in Tamuning, with a pump capacity of 200 gpm.

According to available records and the assumption made earlier in this section, both pumps are now peaking out at less than their respective capacities when average sewage flows are analyzed. Table IX relates water demand, sewer demand and lift station capacity in terms of average flow. The total wastewater collected is 668 gpm.

Service Zone A accounts for 159 gpm of average sewage flow, comfortably less than the 200 gpm capacity of Ypao Pump Station. Service Zones B through H contribute 524 gpm of average flow through the Tumon Lift Station, which has a 700 gpm capacity.

#### Peak Flow Analysis

From the above analyses of average range flows it appears that the present system can handle the existing (and more) development. However, these statements of adequacy are true only if the flows to the pumps are kept at a gradual daily rate, approximating average flow demands. This situation is presently enjoyed only because the major hotels and apartment complexes are operating with sumps and ejector pumps. Sewage loads are held until prescribed hours when the loads are emptied in the system. If two or more of these ejector pumps are operating at the same time or during the peak demand hours of the day (6:00 A. M. to 8:00 P. M.), serious overtaxing of the lines and the lift stations will occur.

The demand/capacity analysis of a sanitary sewer system must account for peak flows which realistically occur within the Tumon Bay area. Peak flows reflect the day-to-day living patterns of residents, tourists and businesses throughout the study area and have a multiplier effect on the average flow quantities.

**TABLE IX**  
**DEMAND/CAPACITY**  
**ANALYSIS OF AVERAGE SEWAGE FLOWS**  
**ON YPAO AND TUMON LIFT STATIONS**

| <b>SERVICE<br/>ZONE</b> | <b>WATER DEMAND<br/>IN GALLONS<br/>PER DAY</b> | <b>SEWER DEMAND<br/>IN GALLONS<br/>PER DAY</b> | <b>DEMAND ON<br/>200 GPM<br/>YPAO LIFT<br/>STATION<br/>IN GPM</b> | <b>DEMAND ON<br/>700 GPM<br/>TUMON LIFT<br/>STATION<br/>IN GPM</b> |
|-------------------------|------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>A</b>                | <b>229,500</b>                                 | <b>206,550</b>                                 | <b>144</b>                                                        | <b>N/A</b>                                                         |
| <b>B</b>                | <b>78,000</b>                                  | <b>70,200</b>                                  | <b>N/A</b>                                                        | <b>49</b>                                                          |
| <b>C</b>                | <b>340,000</b>                                 | <b>306,000</b>                                 | <b>N/A</b>                                                        | <b>213</b>                                                         |
| <b>D</b>                | <b>23,000</b>                                  | <b>20,700</b>                                  | <b>N/A</b>                                                        | <b>15</b>                                                          |
| <b>E</b>                | <b>186,500</b>                                 | <b>167,850</b>                                 | <b>N/A</b>                                                        | <b>117</b>                                                         |
| <b>F</b>                | <b>500</b>                                     | <b>450</b>                                     | <b>N/A</b>                                                        | <b>N/A</b>                                                         |
| <b>G</b>                | <b>135,000</b>                                 | <b>121,500</b>                                 | <b>N/A</b>                                                        | <b>85</b>                                                          |
| <b>H</b>                | <b>71,500</b>                                  | <b>64,350</b>                                  | <b>N/A</b>                                                        | <b>45</b>                                                          |
| <b>TOTAL</b>            | <b>1,064,000</b>                               | <b>957,600</b>                                 | <b>144</b>                                                        | <b>524</b>                                                         |

Several technical references address the peak flow demands for tourist/resort areas. The consensus of advice with population densities similar to Tumon Bay is a 3.5 multiplier factor.<sup>4</sup> Computations to adjust for peak sewage flow, therefore, indicate an extremely inadequate system which receives a theoretical demand of more than three times its capacity. This criticality is not now manifested because of the holding tank arrangements which delay sewage ejection into the system until scheduled non-peak hours.

In the final analysis of sewage infrastructure, the peak flow demand/capacity figures are more valid for our purposes because:

1. The existing arrangement for sewage holding tanks is not preferred from the stand-points of cost to construct, operate, and maintain, although some hotels may resort to such appurtenances because they are constructed below grade.
2. Sanitary sewer systems are conventionally designed on the basis of peak flows, rather than average flows, in order to attain an infrastructure plant that fully accommodates an area's requirements.

The demand/capacity analysis depicted on the "Water and Sewer" Plate and in Table X is calculated in millions of gallons per day with the Tumon and the Ypao Lift Stations as the critical links in the system. This approach is satisfactory to portray the system's inadequacy, however, additional engineering and design are necessary to analyze the peak flow capacity of the transmission lines. The Sewer Facilities Master Plan concludes that only the area's lift stations and force main require upgrading to handle present peak loads.

The demand capacity analyses clearly illustrate the tenuous operation of Tumon Bay's sewer system. Of all the support infrastructure necessary to tourism development in the study area the sewer system alone can justify a moratorium on development. Without additional pumping and line capacity the existing structures must continue to operate sewage holding tanks — an expensive and objectionable practice.

So long as the existing demand for sewer facilities falls short of the system's capacity, proposals for new development must be handled very cautiously. The Public Utility Agency of Guam is managing a delicately-balanced system at the present time. There is little room for error. Additional sewage loads will demand holding tanks and a well orchestrated schedule of ejection into the sewer interceptor.

A final aspect of the sanitary sewer system in the Tumon Bay concerns the Mamajanao Lift Station, downstream of the Tumon system, located near the Harmon Sink on Route 1 (not shown on Base Map). This pump station handles Tumon Bay and other sewage flows and is frequently overloaded. Any improvements in the Tumon Bay system to accommodate peak flow loads, therefore, would only add to the problems at the Mamajanao Station, unless similar upgrading of that facility is scheduled concurrently.

**TABLE X**  
**DEMAND/CAPACITY**  
**ANALYSIS OF PEAK SEWAGE FLOWS**  
**ON YPAO AND TUMON LIFT STATIONS**

| SERVICE ZONE                               | DEMAND OF<br>AVERAGE<br>SEWAGE FLOW<br>IN GPM | DEMAND OF<br>PEAK SEWAGE<br>FLOW<br>IN GPM | CAPACITY OF<br>YPAO LIFT<br>STATION<br>IN GPM | CAPACITY OF<br>TUMON LIFT<br>STATION<br>IN GPM |
|--------------------------------------------|-----------------------------------------------|--------------------------------------------|-----------------------------------------------|------------------------------------------------|
| A                                          | 144                                           | 504                                        | 200                                           |                                                |
| B                                          | 49                                            | 172                                        |                                               |                                                |
| C                                          | 213                                           | 746                                        |                                               |                                                |
| D                                          | 15                                            | 53                                         |                                               |                                                |
| E                                          | 117                                           | 410                                        |                                               |                                                |
| F                                          | Ø                                             | Ø                                          |                                               |                                                |
| G                                          | 85                                            | 298                                        |                                               |                                                |
| H                                          | 45                                            | 158                                        |                                               |                                                |
| TOTAL PEAK<br>FLOW<br>DEMAND FOR<br>B TO H |                                               | 1,837                                      |                                               | 700                                            |

#### D. POWER SYSTEM

The Tumon Bay area is primarily served by the Guam Power Authority Tumon Substation located at the southeast corner of Marine Drive and Tumon Road. The area can also be served by the Tamuning and/or the Harmon Substations if necessary.

The Tumon Substation presently has a capacity of 12 MVA and a demand of 9.4 MVA with the 13.8 KV distribution system. The 2.5 MVA excess capacity is directed at service zones A, B and C for this analysis. Of the 400 available amps, the Substation is now fulfilling a demand for 250. GPA also has the capability to feed power to service zone A from the Tamuning Substation, currently operating with an excess capacity of 6 MVA and 200 amps.

For analysis purposes of this study, the Harmon Substation is selected to provide power to the three most northern service zones of D, E, and F. This substation can generate 400 amps of power for these zones, and 250 amps is presently demanded.

The Harmon Substation is also selected to provide power for service zone G and H, where 400 amps are available and 220 amps are now in demand.

The distribution of power throughout the Tumon Bay study area is open to several alternatives. Because the Tamuning, Tumon and Harmon Substations can all supply power to that area, all existing demands are satisfactorily accommodated. The following Table XI shows the demand and capacity, measured in amps, for each service zone. This analyses are also depicted on the enclosed Plate, "Power and Communications".

TABLE XI  
DEMAND/CAPACITY ANALYSES FOR THE POWER SYSTEM

| SERVICE ZONES | DEMAND IN AMPS | CAPACITY IN AMPS |
|---------------|----------------|------------------|
| A             | 250            | 400              |
| B             | 250            | 400              |
| C             | 250            | 400              |
| D             | 250            | 400              |
| E             | 250            | 400              |
| F             | 250            | 400              |
| G             | 220            | 400              |
| H             | 220            | 400              |



## E. TELEPHONE ANALYSIS

The telephone infrastructure is the newest (but as yet unused) aspect of the Tumon Bay infrastructure. Nearly all cables are underground and installed during the last six months. The system is scheduled to be activated by June 1980.

All telephone cable in the study area is depicted on the enclosed "Power and Communications" Plate. The analysis is calculated in private lines based on the existing capacity and on a demand in terms of one private line for every private residence and one private line for every 10 hotel rooms. Additional demand was allocated for commercial and business phones at hotels and commercial buildings.

The demand/analysis for telephone infrastructure by service zone is depicted in Table XII.

TABLE XII

### DEMAND/CAPACITY FOR THE TELEPHONE SYSTEM

| SERVICE ZONE | DEMAND IN<br>PRIVATE LINES | CAPACITY IN<br>PRIVATE LINES |
|--------------|----------------------------|------------------------------|
| A            | 160                        | 274                          |
| B            | 90                         | 3050                         |
| C            | 320                        | 1830                         |
| D            | 90                         | 940                          |
| E            | 90                         | 175                          |
| F            | 10                         | 50                           |
| G            | 270                        | 1890                         |
| H            | 150                        | 3550                         |

## SECTION V

### ANALYSIS OF OTHER DEVELOPMENT FEATURES

In addition to land and infrastructure, other features of the Tumon Bay study area have an impact on tourism development feasibility. These are addressed in this section.

#### A. ZONING

The Tumon Bay area is almost exclusively Hotel/Resort Zone, with pockets of residential areas scattered throughout the central portion of the study area. While the language of this zoning law, PL 14-141, is conducive to tourism development, it also permits several other land uses without concise management controls. Unless a more precise zoning ordinance and land use plan are established, therefore, Tumon Bay will continue its mixture of residential, commercial and resort development.

#### B. VEHICULAR CIRCULATION

The San Vitores transportation artery is in generally good condition and does not inhibit tourism development at this time. Several localized problems, however, are nuisances to the safe and smooth flow of traffic within Tumon Bay. These spots include the slippery and accident prone curve on San Vitores just west of Bay View Apartments, several raised manhole covers, pavement depression at lateral line crossings, and traffic congestion at the Tumon Road/San Vitores intersection.

The local roads are generally in fair condition, as Guam standards apply, although right-of-way disputes compound maintenance and reconstruction requirements. Most hotels and major developers have built their own access roads rather than rely on the government's construction/maintenance program. The collector between Pale San Vitores and Marine Drive, Duggan's Gulch road, is moderately used despite its narrowness and a speed bump. This link will continue to become an important collector for local traffic, especially for service zones G and H.

With the exception of Ypao Beach Park, beach access by motor vehicle is unorganized and inadequate. Several roadways (public and private), bull cart trails beaches and hotel parking lots are regularly transgressed by cars, trucks and jeeps seeking proximity to the beach. Without a system of developed parking areas these inappropriate, and in fact illegal, routes will continue to serve as parking areas.

### C. STORM SEWERS

A storm sewer system is not established in Tumon Bay, and at least four storm sewers discharge directly into the Bay. Additional discharge points are not expected. Different opinions are now espoused by government officials regarding the need for a storm sewer system. The common objective, of course, is to recharge storm water into the island's aquifer and eliminate all direct discharge into bay water. Two proposed developments have recently demonstrated the feasibility of handling storm-water onsite, without even resorting to a ponding basin. This is an encouraging trend.

Judging from the increasing difficulty to obtain Army Corps of Engineers permit for stormwater discharge, (due to environmental and public health objection) and the unsightly waste of land required by ponding basins, large resort developments will probably solve their storm water problem with on-site design ingenuity.

### D. BEACH ACCESS

The "Circulation and Public Lands" Plate depicts both public beach access and access through hotels to the beach, generally used by hotel guests and tourists. Since service zones A, B, C, D, and E are primarily pedestrian-oriented rather than vehicle-oriented, the importance of beach access by foot cannot be overemphasized. The most used access routes by the public are now at Ypao Beach and at the San Vitores Shrine at Naton Beach.

It is also common practice for the public to use the many bullcart trails and privately-owned access roads that lead to the beachfront. While these routes now accommodate the demand for beach access, this is not the preferred arrangement. Properly planned and developed public access, complete with parking areas, solid waste storage facilities, restrooms and other public recreation facilities are better. The government should not continue to rely on the unorganized maze of public and private accesses which is now assaulted by cars between Ypao and the San Vitores Shrine area.

In the final analysis, therefore, sufficient developed public access to the beach is not available.

### E. SOLID WASTE MANAGEMENT PRACTICES

Solid waste management practices throughout the study area reflect island-wide standards. Residential storage is curbside and the Government's collection service is generally reliable on a twice-weekly schedule. Commercial waste storage is by 3-cubic yard bulk containers and collected by commercial sanitation operators. These private collection services can accommodate additional customers, so that capacity will expand with demand. All trash is disposed at the Ordot Landfill.

Bulky solid wastes, especially appliances and abandoned vehicles are scattered throughout the residential areas. The Government's once or twice yearly program to dispose of these items is dependent on owner's formal release and, therefore, not always successful.

Any time spent on either the Tumon beach or throughout the study area reveals that both storage and collection practices are not yet first-class, although they have improved dramatically over the recent years. Two aspects, in particular, are the inadequate collection of beach litter and the solid waste storage facilities along the beach area.

Only hotel beach fronts are routinely maintained. The Tumon Beach is occasionally cleared (litter only) by civic groups and people collecting cans for sale to recycling operations.

An adequate number of strategically-located litter cans would, of course, alleviate some of the beach litter problem. Similar equipment is available at other park facilities and could be permanently cited along the beach. Regular collection of this trash is of paramount importance.

## SECTION VI

### DEVELOPMENT FEASIBILITY

Tables XIII and XIV (also depicted on transparent Overlay No. 5, Demand Capacity Analysis), consolidate the infrastructure analyses within each service zone and projects the capacity for additional development in hotel rooms for the beachfront service zones and for apartment units in the two inland service zones.

In order to assign a standard measurement of forecasting development feasibility, a typical hotel and typical apartment complex were conceived. The following profiles reflect the average hotel and apartment complex in Tumon.

- Hotel
  - = contains 200 rooms
  - = occupies eight acres of land
  - = requires 70,000 gallons of water per day (consumption only)
  - = discharges a design peak flow of 154 gpm of sewage
  - = uses 30 amps of power
  - = needs 30 private telephone lines

- Apartment/Condominium Complex
  - = contains 50 two-bedroom units
  - = occupies 2 acres of land
  - = requires 22,000 gallons of water per day (consumption only)
  - = discharges a design peak flow of 48 gpm of sewage per day
  - = uses 10 amps of power
  - = needs 50 private telephone lines

The difference between the demand and capacity of land, water, sewer, power and telephones, as depicted in the previous section and respective Plates, is defined as Excess Capacity when capacity exceeds demand. This theoretical excess is then prorated among the service zones in terms of additional hotel rooms (in increments of 200 rooms) for zones A, B, C, D, E, and F and in terms of additional apartment units (in increments of 50 units) for zones G and H.

Where demand, as defined, exceeds capacity an infrastructure shortfall is identified and, of course, additional development relying on these particular services is not recommended. The reader is cautioned to remember, however, that except for land and the sewer system in service zone A, a balance of all infrastructures exist among the service zones in Tumon Bay. Certain excess demand in one zone can be conceivably shifted to excess capacities in another zone. The final analyses represented in Tables XIII and XIV, however, still reflects the study area's overall demand and capacity requirements of the integrated infrastructure that now services Tumon Bay.

TABLE XIII

**FEASIBILITY FOR ADDITIONAL HOTEL ROOMS  
IN TUMON BAY SERVICE ZONES A - F**

| SERVICE<br>ZONE | LAND  | WATER     | SEWER     | POWER | TELEPHONE |
|-----------------|-------|-----------|-----------|-------|-----------|
| A               | -0-   | Shortfall | Shortfall | 200   | 600       |
| B               | 200   | Shortfall | Shortfall | 400   | 19,600    |
| C               | -0-   | Shortfall | Shortfall | 400   | 10,000    |
| D               | 1,000 | Shortfall | Shortfall | 600   | 5,600     |
| E               | -0-   | Shortfall | Shortfall | 400   | 400       |
| F               | 1,600 | -0-       | -0-       | -0-   | 200       |

TABLE XIV

**FEASIBILITY FOR ADDITIONAL APARTMENT UNITS  
IN TUMON BAY SERVICE ZONES G AND H**

| SERVICE<br>ZONE | LAND | WATER     | SEWER     | POWER | TELEPHONE |
|-----------------|------|-----------|-----------|-------|-----------|
| G               | 800  | Shortfall | Shortfall | 450   | 1,600     |
| H               | 550  | Shortfall | Shortfall | 450   | 3,400     |

## SECTION VII

### DEVELOPMENT TRENDS IN TUMON BAY

It is always interesting to scrutinize development trends in order to gain some overall insight about future land use activities. Within the limits of this study's scope and available data, a trend is apparent in the Tumon Bay area.

Essentially three land uses are prevalent in the Tumon Bay area: Hotel/Resort, Commercial and Residential. This is a common and, in fact, desirable mix of development when managed in accordance with a preconceived plan.

Development trends are often highlighted by construction activity, and Tumon is no exception. The number of building permits issued for Tumon<sup>5</sup> during the past five years is not particularly impressive:

|               |   |        |           |
|---------------|---|--------|-----------|
| Residential   | - | 30 for | \$619,050 |
| Apartments    | - | 7 for  | \$519,680 |
| Commercial    | - | 16 for | \$104,860 |
| Miscellaneous | - | 23 for | \$402,040 |

These are hardly statistics of a "boom period" and no new hotels were added. Nevertheless, the dollar amounts are substantial, especially for the commercial uses, which generally support the area's tourist trade. Perhaps more significant is that half of the commercial permits (eight) were for new buildings, amounting to 83% of the construction dollars. The large, new commercial developments are for shops selling tourists items (non-prescription drugs, sunglasses, moped rental, etc.), apparel and articles, small restaurants, and pornographic literature. Of course, every hotel has its own battery of similar retail outlets. The trend here is clear that the free enterprise system for retail sales in Tumon Bay has not yet exhausted the tourist market. There is no reason to believe that Tumon Bay is becoming "over saturated" with these outlets. As their business volume drops off, so will investment dollars for more commercial floor space.

This commercial/retail growth is a generally healthy sign for Tumon Bay economy so long as some control is exercised over the quality of construction and the location of these facilities. Construction quality, (not to be confused with appearance), is a prerequisite for financing required by commercial investments. With the exception of three wood frame buildings, all commercial structures are substantial in their construction.

The location of these commercial structures, however, is left entirely to the real estate acumen of the developer. The Government of Guam has no power and presently no plan to restrict commercial/retail activities to certain land-use areas within the Tumon Bay.



Residential development within Tumon Bay has progressed at an investment pace only slightly faster than commercial growth. The real estate is too expensive for most homeowners on Guam and, therefore, only 13 new homes and 2 new apartments have received building permits in the past five years. Again, the location of these residential units is not within the purview of Government land use planning.

The common denominator of these trends and analyses is that growth has prevailed throughout Tumon Bay with only minimum management. Yet the area remains one of the most charming natural amenities in this part of the world. Thanks to the indefatigable efforts of various Boards, Commissions and individuals – and largely to luck – during the past ten years Tumon Bay has so far escaped the irreparable scar so common to unplanned tourist development.

The previous planning for comprehensive development and economic growth on Guam has unmistakably tied our economic destiny to a viable tourist industry. In Guam, tourism is Tumon Bay. It naturally follows that a preconceived concept of the area – a Tumon Bay Master Plan – is paramount to the success of our long-term economic success in the tourist industry.

Upgrading the infrastructure, as analyzed in previous sections of this report, to achieve balance for development potential is one of the most urgent ingredients to this Plan. Other ingredients include:

1. a reliable projection of tourists to determine the area's intensity of use.
2. a pre-conceived concept of what we want Tumon Bay to look like in 20 years.
3. a land use scheme that allocates resort, commercial, public and residential activities in accordance with that concept.
4. an implementation plan that outlines the legislative and decision making tasks to achieve that concept.

This planning effort is "the desirable development trend" for Tumon Bay during the next two years.

## FOOTNOTES

- <sup>1</sup> Department of Commerce, Tumon Bay Land Use Inventory - Preliminary. Unpublished, (December 1979), p. 14.
- <sup>2</sup> Bureau of Planning, Housing Survey, 1976.
- <sup>3</sup> Guam Environmental Protection Agency and Public Utility Agency of Guam, Water Facilities Master Plan, 1979.
- <sup>4</sup> Metcalf and Eddy, Wastewater Engineering: Collection, Treatment, Disposal (New York, 1972), p. 39.
- <sup>5</sup> Department of Commerce, op. cit., p. 12.

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**APPENDIX B**

**TUMON BAY MASTER PLAN  
RULES AND REGULATIONS FOR DEVELOPMENT**

TUMON BAY MASTER PLAN  
RULES AND REGULATIONS FOR DEVELOPMENT

CONTENTS

- A. Authority, Purposes and Intent
- B. Definition of Terms
- C. Procedures for Application and Submittal Requirements
- D. Mandatory Standards for Development

A. AUTHORITY, PURPOSES AND INTENT

These rules and regulations are to be promulgated in accordance with Public Law 13-40 as amended, by Public Law 15-132, by the Territorial Planning Commission under authority of Titles XIV and XVII of the Government Code of Guam and Public Law 14-41 as amended, by Public Law 14-72, and by Public Law 14-82.

The purposes of these rules and regulations are to establish procedural requirements for development within the Tumon Bay resort area, to establish mandatory standards for development, and to provide guidelines for the development of projects within Tumon Bay. This material has been prepared as an element of the Tumon Bay Master Plan under the authority of Public Law 15-132.

These Rules and Regulations apply to the Tumon Bay area rezoned "H" under the provisions of Public Law 14-41, as amended by Public Law 14-72 and 14-82 (Tumon) and/or subsequently rezoned to reflect the Tumon Bay Master Plan. These are final Rules and Regulations and supercede and replace the Interim Rules Regulations adopted on March 10, 1978.

B. DEFINITION OF TERMS

The following terminology is used in the regulations to define the standards and principles for development in Tumon Bay. The definitions provided here are intended to clarify and supplement those terms defined elsewhere in the Government Code.

|             |                                                                                                                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bonuses     | Additional incentives given in return for public benefits and amenities provided beyond the scope of these rules and regulations.                                                                                                                       |
| Buffer Zone | Strip of land created to separate and protect one type of land use or activity from another. Usually this will entail the provision of open space, landscaping, fencing or other means as necessary to adequately insulate the incompatible activities. |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Building                | Permanent or temporary structure of vertical construction with open or enclosed sides and roof. This includes all covered structures but does not include open structures such as paved areas, decks and landscaping.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Building Envelope       | The net cubic space that remains for placing a structure on a site after open space, building setback and height standards are observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Building Height         | For purposes of these rules and regulations, the vertical distance from the lowest portion of the natural ground elevation and measured to the highest portion of the building roof.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Cluster Development     | Development that allows the reduction of setbacks below minimum requirements to group buildings, develop common open space, joint use parking, combined access and service, and other concepts which reduce the overall intensity of land utilization.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Community Facilities    | Public or privately owned facilities used by the public including streets, parks, beaches, playgrounds, churches and related uses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Conditional Use         | A use that may locate in a zone provided it will not be detrimental to the public health, morals and welfare and will not impair the integrity and character of the zone.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Conservation Easement   | The purchase of specific rights from an owner which limit the environmental uses to which the owner may put his land in the future.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Dwelling, Single family | A detached building containing only one dwelling unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Dwelling, Multi-family  | A detached building containing two or more dwelling units.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Environmental Impact    | The assessment of a proposed development or activity to determine if it will have significant environmental effect on the natural and manmade environment. Significant environmental effects are generally associated with air and water quality, wildlife habitat, food chains, neighborhood and community structure and quality of life, noise, endangered plant and animal species, appearance and surrounding of scenic, historical, cultural, archaeological, or recreational sites, and where action will induce secondary effects on others from the direct beneficiaries or targets of an action such as traffic congestion, overload of infrastructure, flooding, social, cultural and moral side effects. |

|                   |                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exception         | Provision of an exemption or variance from compliance with the terms and conditions of the regulations. Granted where there are practical difficulties in meeting existing requirements if the deviation or exception will have a positive impact on adjacent properties.                                                                       |
| Guidelines        | Policy, principles and criteria requiring developments to be suitable, harmonious and in keeping with the general appearance, resort character and environmental preservation of the area and its surroundings.                                                                                                                                 |
| Landscaping       | An area covered with soft live flora such as lawn, ground cover, trees, shrubs or any other materials which present a natural and green appearance. This includes natural vegetation left undisturbed.                                                                                                                                          |
| Lot               | Parcel of land occupied or to be occupied by a use, activity or buildings together with all yards, open space, parking areas and other areas as required.                                                                                                                                                                                       |
| Nonconforming Use | A structure or use that is not permitted by the rules and regulations currently in effect. If established prior to the promulgation of the rules and regulations, it is classified as legal nonconforming use and may continue although it may not be extended, enlarged, converted to new nonconforming use or rebuilt as a nonconforming use. |
| Open Space        | The portions of a parcel unoccupied or undisturbed by buildings, roads, parking or ancillary structures from the ground upward. Sidewalks, decks and plazas are considered open space.                                                                                                                                                          |
| Setback Line      | The requirement that a building be setback a certain distance from the mean high watermark, street or lot line either on the ground level or at a prescribed height.                                                                                                                                                                            |
| Preliminary Plan  | A plan based on limited study and analysis. Its function is to present and examine preliminary ideas and to set a direction for subsequent stages of the work. Its purpose is to define certain key relationships, display the scope and nature of the development and establish the criteria by which the project will be completed.           |
| Site Coverage     | The total square footage of a lot covered by a building measured on a horizontal plane at mean grade level, exclusive of uncovered decks, sidewalks steps, parking or access roads.                                                                                                                                                             |
| Standards         | Mandatory or compulsory requirements establishing specific criteria to be met by a project.                                                                                                                                                                                                                                                     |
| Story             | That portion of a building between the surface of any floor and the surface of any floor or roof next above it.                                                                                                                                                                                                                                 |



|      |                                                                                                    |
|------|----------------------------------------------------------------------------------------------------|
| Use  | The purpose of which land or a building is arranged, designed, occupied or intended for.           |
| Yard | The space on a property not built upon and situated between the building and its nearest lot line. |

#### C. PROCEDURES FOR APPLICATION AND SUBMITTAL REQUIREMENTS

Application for conditional uses to be located within the Tumon Bay project area shall be submitted to and approved by the Territorial Planning Commission prior to the start of clearing, grading or construction of any project or portion of project. Applicant must complete the Tumon Bay Development Application Form and provide all supporting information required by this section. Where necessary information is not submitted or not prepared in sufficient detail for the thorough review by the Commission and its advisory committees, the applicant shall be required to provide such supporting information prior to review of the application by the Commission. The Commission may require the submission of detailed construction drawings as work is undertaken to permit the analysis of construction conformance to the law, rules and regulations and conditions imposed by the Commission. The application should be submitted by the landowner or other entity having a legally recognized interest in the land.

##### Procedures for Application Submittal

Approximately one month will be required for the complete review of each application provided complete and accurate information has been provided. Each application and the supporting material shall be first reviewed by the Environmental Review Committee (ERC) for adherence to the Mandatory Standards and Guidelines for development in Tumon Bay. The ERC will review each application in detail and will consult to the extent necessary with the applicant or his representative. If warranted, the applicant may be requested to revise his application to meet the criteria of the Mandatory Standards and Guidelines.

Following review by the ERC, the application will be reviewed by the Subdivision and Development Review Committee (SDRC) as a technical representation of all pertinent Government of Guam agencies. SDRC will hold a public meeting on each application at which time the applicant or his representative should attend.

Review comments and recommendations by the ERC and SDRC shall then be forwarded to the Territorial Planning Commission for their final review. At a public meeting the Commission shall either approve, approve with conditions, or disapprove in whole or in part that application and its supporting information. The Commission may stipulate that the supporting material be revised to conform to the conditions required by the Commission, such revision to be submitted to the Commission or, as designated, the Chief Planner prior to final approval by the Commission. No clearing, grading or demolition, sign or construction permit shall be issued by the Building Official until such time as this revised material is submitted to the Commission and final approval granted.

Application for a construction permit of any type shall include a complete copy of the approved application, supporting material, Commission approval and conditions.

Any proposed use or building, or revision which has not been included in the approved application, shall be approved by the Commission before undertaking any such work and shall be reflected in a revised building permit application.

A performance bond will be required for all development undertaken pursuant to an approved application. The amount of the bond shall be One Hundred and Ten Percent (110%) of the estimated infrastructure, storm drainage and landscaping costs for the project, and shall not be less than Four Thousand Dollars (\$4,000.00). The entire bond or undertaking of any portion thereof shall be forfeited as determined by the Commission for failure to comply with the conditions of the application and approvals. This bond must be presented to the Building Official prior to issuance of a building permit for any portion of the project. The entire bond, or any portion thereof, shall be forfeited as is required to complete the site preparation, infrastructure, stormwater disposal, erosion control and landscaping portions of the project should these not be completed by the applicant. The Performance Bond shall not be released in any form until the Commission has accepted the development or improvements as meeting the scope of its approval and conditions.

The Commission shall set a maximum time period within which all of the improvements authorized in the application approval shall be completed. The time period shall be based on the size, character and complexity of the authorized improvements. The Commission may, for good cause shown, grant any extension of time.

Upon completion of any portion of the project in accordance with the approved application, the Building Official shall certify to the Commission that the project has been completed in accordance with the approved application. Occupancy permits shall not be granted by the Building Official until such time that the Chief Planner has the opportunity to visit the project to determine that work has been completed in accordance with the approved application.

Requirements for the preparation of supporting information and posting of performance bonds as outlined in this section shall not apply to construction of individual single family dwellings other than subdivisions of three or more units.

#### Submittal Requirements

For submittal requirements, the applicant shall complete in its entirety the Tumon Bay Development Application prior to consideration by the Commission. Supporting information which must accompany the application includes the following material:

1. Vicinity Map indicating location of development in relation to its surrounding environment.
  - a. Identification and location of adjacent structures and activities within 500 feet of the proposed development.
  - b. Location of road rights-of-way, easements and other travel ways.
  - c. Location and size of existing utilities, watercourses, and drainage facilities located on or adjacent to and serving the proposed development.

- d. North arrow and graphic scale.
2. Preliminary Site Plan establishing the overall scope of the development and its relationship to existing conditions. The plan shall indicate the extent of phasing of future increments which may be undertaken under a separate application.
- a. Length and bearing of exterior property boundaries of the development. Accurate location of the mean high water line and the Territorial Seashore Protection beach setback where applicable.
  - b. Existing and proposed topography with contour intervals of 2 feet. Where slopes exceed 15 percent, 5-foot contour intervals may be used.
  - c. Accurate placement and outline of existing structures, rock outcroppings and other features located on the site. Location and size of all existing trees with a trunk diameter greater than 6 inches and an indication of where trees will be removed.
  - d. Approximate layout and dimension of each proposed structure, facility and use to be located within the development. Dimension of setbacks to vertical structures. Location of free-standing signs.
  - e. Indication of width of pavement for all improved roadways including streets and driveways to be located within or adjacent to the development. Identification of improvements to be made within existing rights-of-way, including sidewalks and landscaping.
  - f. Proposed parking layout indicating the required automobile and bus parking spaces, proposed service areas and landscaping elements.
  - g. Indication of the size and layout of natural and improved open space. Identification of improvements for public use including beach access routes.
  - h. Proposed methods and approximate location of facilities for on-site disposal of stormwater runoff.
  - i. Landscaping and revegetation plan indicating trees to be saved and scope of new landscaping to be provided. This plan is understood to be a tentative plan. Final plans will be submitted for review and approval of the Chief Planner prior to issuance of a building permit.
  - j. North arrow and graphic scale.
3. Preliminary design of all buildings included within the development to fully explain the visual appearance of the development and its relationship to the adjacent environment.
- a. Elevation or perspective sketch of the main view of each structure. At a minimum, this must include the view from San Vitores Boulevard or other main vehicular and pedestrian access to the site. Where the development fronts on the Territorial Seashore Protection Reservation, a view from the beach side of the development is required.

- b. Section view through the site and major structures indicating existing groundline, proposed finish grades, height and setback of structures. Setback-height curves are provided in these Standards and should be used to indicate the placement of the building within the setback limitations.
- c. Graphic scale.

#### D. MANDATORY STANDARDS

The following regulations constitute compulsory regulations for all projects and developments to be located within Tumon Bay. Any deviation from these stipulations must be stated specifically in the application form and must be acknowledged in approval of all or part of an application by the Commission. In all cases, the applicant has the burden of proving that any deviation will not have an undue and adverse impact on the Tumon Bay area. The Commission, in determining the reasonableness of deviations, recognizes the public benefit which will incur from additional private and public amenities provided by the development.

##### I. OPEN SPACE RATIO

Land use intensity is a method for relating site coverage by buildings to related needs for open space and parking/access/service area. Site coverage is intended to be the "footprint" of buildings on the site and does not consider the floor area of upper floors or the overall density of the development. Where here the first floor is elevated above the ground level, its ground coverage ratio shall be based on the proposed use for the area below the structure and the amount of open space which will be provided.

For purposes of this ratio, open space is considered to be plazas, terraces, decks and other outdoor areas which are not covered or walled, landscaped areas, recreation and open space, improved or unimproved natural areas, covered stormwater disposal areas, and pedestrian walkways. The applicant must provide for and establish adequate procedures to insure the continuity, conservation and maintenance of open space. Subsequent modification to the quality or quantity of open space must be approved by the Commission.

Parking for purposes of this ratio is considered to be vehicle parking areas including access roads, streets and drives. Loading and service areas are considered to be part of the parking area.

The figure below indicates the maximum percent of site coverage for structures and parking roads and services, the minimum allowable site coverage for open space.

|                                                 | STRUCTURES | PARKING, ROADS<br>& SERVICE | OPEN SPACE |
|-------------------------------------------------|------------|-----------------------------|------------|
| Resort                                          | 20%        | 35%                         | 45%        |
| Tourist-<br>Commerical                          | 25%        | 45%                         | 30%        |
| Multi-Family<br>Residential                     | 20%        | 45%                         | 35%        |
| Single-Family<br>Residential                    | 20%        | 10%                         | 70%        |
| Hillsides & Areas<br>of Natural<br>Significance | 15%        | 25%                         | 60%        |

## II. SETBACK-HEIGHT STANDARDS

The major considerations when evaluating setback-height standards are light, air, open space, compatibility with adjacent uses, preservation of scenic views and the overall aesthetics and character of the area. For Tourist/Commercial and Single-family Residential zones, the height of vertical construction will be strictly enforced at two (2) stories, not to exceed 30-feet. This standard coincides with the current zoning law. For Resort and Multi-family Residential a height limitation is not specified. Rather, the setback controls establish the placement and space between buildings, with the height to seek its most efficient relationship.

It is generally advantageous to site buildings as objects with adequate open space surrounding each structure to allow for the continued enjoyment of views and vistas by all properties. Although a ceiling on height is not prescribed, previous policies have delineated the crest of the hillside adjacent to Marine Drive as an overall ceiling, i. e., that no building should project above the crest.

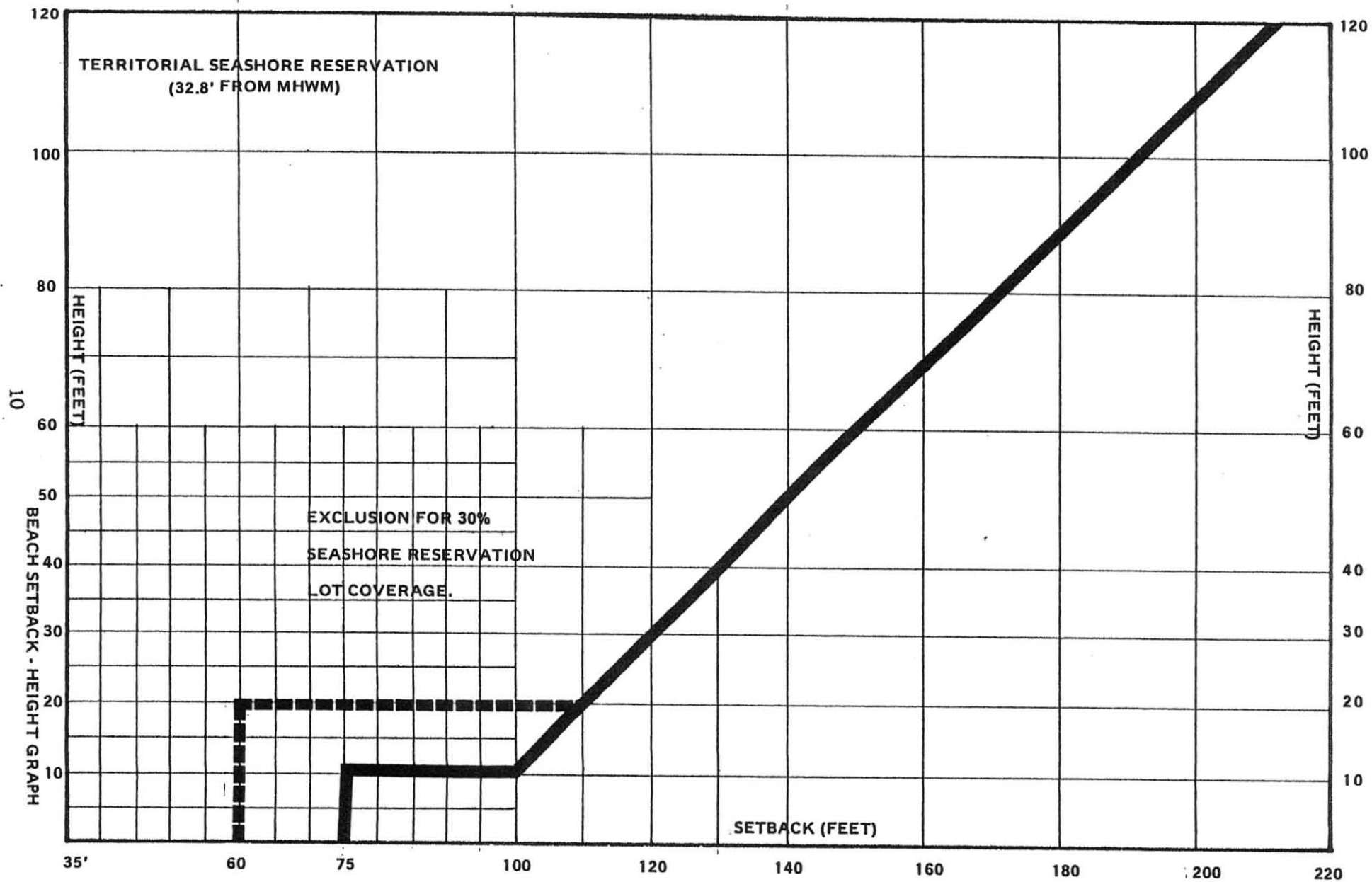
Height-setback graphs are provided for each land use. These curves reflect the relationship between height and the space between buildings. Additionally it is recommended that taller buildings be clustered in a manner to minimize the impact of each individual tower. Certain concessions in the setback-height standards can be made by the Commission where a desirable concept of clustering is proposed. The intention of clustering and spacing of buildings in the Resort zone is especially relevant to the image of the area and the maintenance of views from residential properties inland and against the encircling hillside. It is not desirable to create a wall of buildings which will effectively cut-off the view of the shoreline and ocean.

Setback-height relationships for development occurring adjacent to the hillside shall be determined by the Commission based on topographic and view considerations.

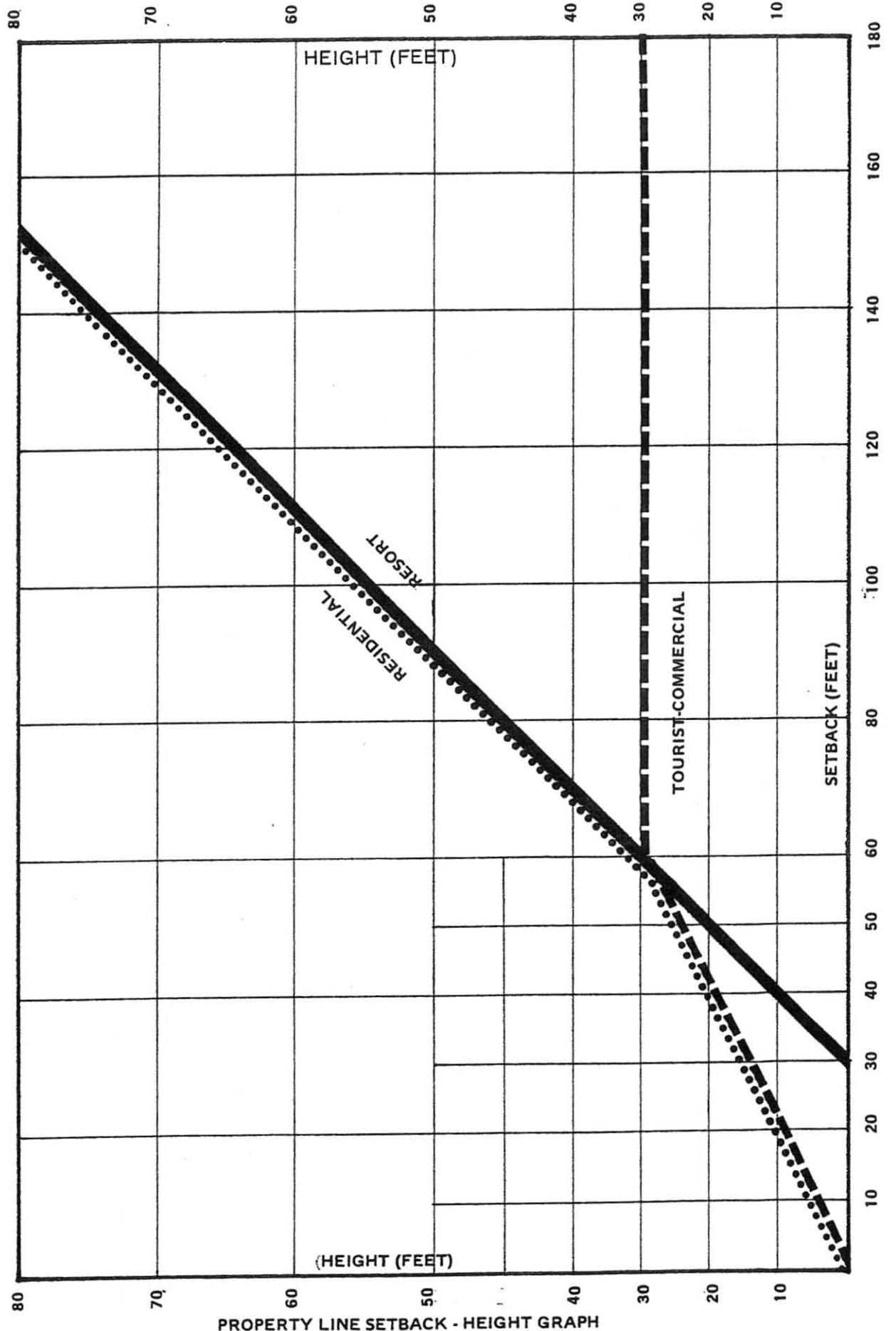
Development within or adjacent to the Territorial Seashore Protection Reserve must meet the requirements of the Seashore Protection Act, Title XVI, and Zoning Law, Title XVIII, as further defined herein.

Setbacks shall be provided from the mean high water level pursuant to the Seashore Protection Act as follows:

- |                                          |                                                                                                                                                                                                                                                                                     |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Setback (a) 0-10 meters -<br>(32.8 feet) | Beach reservation zone for use as public access and recreation. All development as defined in Title XIV, Section 13412(c), as amended by P. L. 13-154, must receive approval of the Territorial Seashore Protection Commission and other cognizant government and Federal agencies. |
| Setback (b) 32.8 - 75 feet -             | No vertical construction which will obstruct the visual openness and continuity of the beach area is permitted. Open space, rest and recreation areas, swimming pools, terraces landscaping and related outdoor improvements are allowed. Parking areas are not permitted.          |







PROPERTY LINE SETBACK - HEIGHT GRAPH

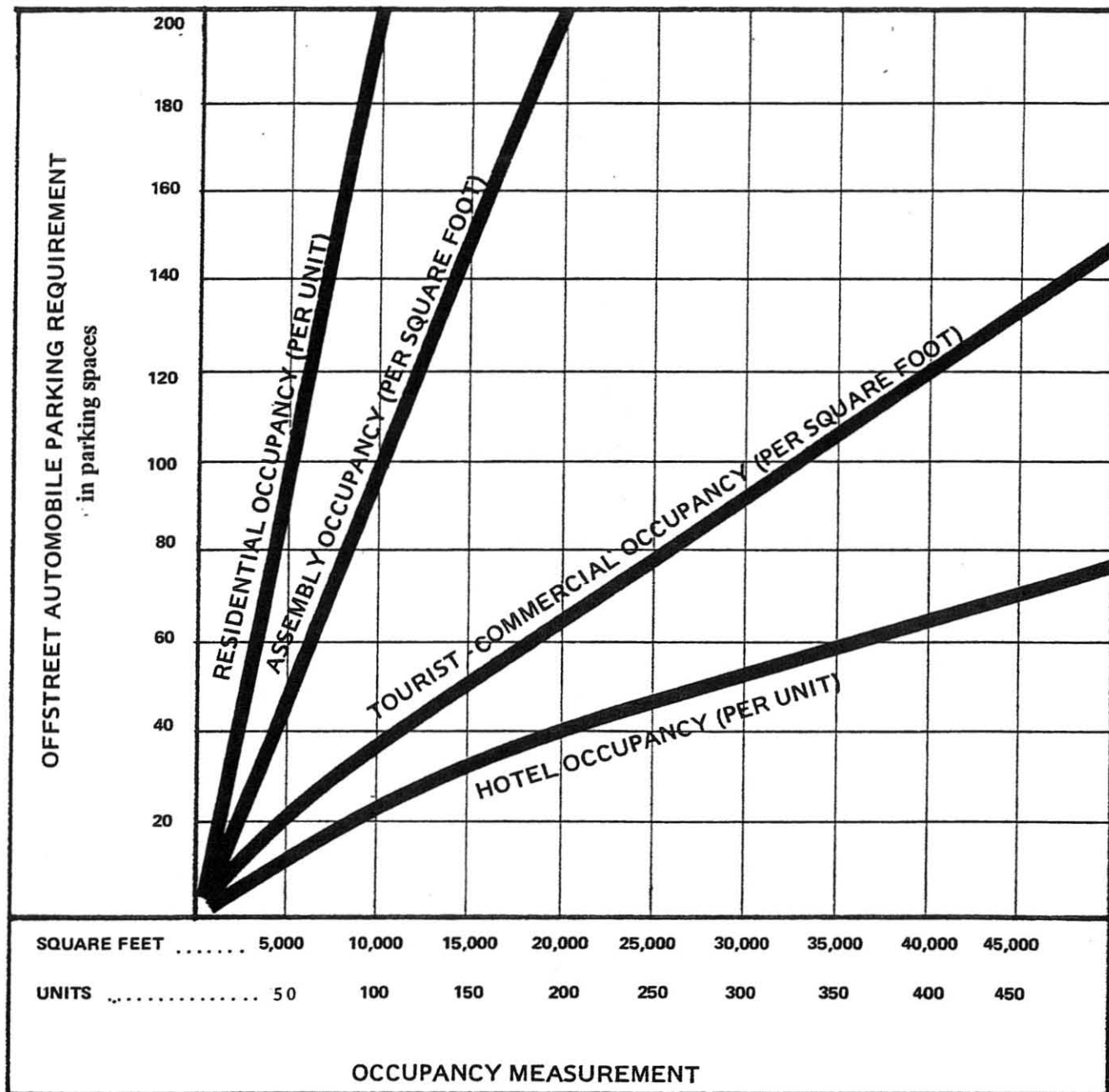
- Setback (c) 75-100 feet - Single-story structures, covered porches, trellises and similar improvements not to exceed 12-feet in height measured from the natural grade line. Parking is permitted.
- Setback (d) 100-feet back - Building height based on Beach Setback-Height graph.
- For those lots where thirty percent (30%) or more of the land area of such lot is affected by the mandatory setback, the building restriction is modified as follows:
- Setback (a) 0-20 feet - Beach recreation zone for use as public access and recreation.
- Setback (b) 20-60 feet - Shall be open space with no vertical construction or parking permitted.
- Setback (c) 60-100 feet - Single and two-story structures only with the total height not to exceed 20 feet in height.
- Setback (d) 100 feet back - Building height based on Beach Setback-Height graph.
- In the areas where a cliff or a bluff higher than 25-feet occurs adjacent to the Seashore, the Commission shall evaluate the setback restrictions on a project-by-project basis.

### III. PARKING REGULATIONS

Automobile parking as required by this section, or as determined by the Commission, shall be provided prior to issuance of an occupancy permit for use of any development or activity including enlargement and extension of existing facilities. Required parking shall be maintained throughout the life of the project, and any modification in the provision of the required parking must be approved by the Commission.

Off-street parking space shall be provided as delineated in the "Offstreet Automobile Parking/Requirement" graph.

This graph represents the total automobile parking anticipated and includes the requirement for employee parking. The total parking required for any application shall include the separate requirements for hotel/resort, assembly function, tourist-commercial and residential uses within the project. The total parking required shall be the total of all occupancy requirements. The Commission, should they feel it is warranted, may increase or decrease this parking requirement to provide for exceptional circumstances.



**NOTE:**

- 1) The total offstreet parking to be provided is based on the sum total of the individual requirements for each occupancy to be included in the project.
- 2) Parking requirements for recreational, amusement and open space activities will be determined by the Commission.
- 3) Assembly occupancy includes Restaurant, Dining, Banquet, Drinking, Convention.

For usages and activities with a large ratio of building area to user or employee population, the total off-street parking and service requirement shall be established by the Commission based on the projected use and vehicle load forecast. This will include those projects utilizing extensive open space or outdoor area, amusement and recreational oriented projects.

In addition to the parking as required by the Graph, the following requirements and provisions apply to off-street parking provided in conjunction with each development:

1. Bus parking for Resort Zone - one (1) bus parking space for each twenty (20) automobile parking spaces.
2. Joint-use parking available for public usage - Ten percent (10%) of the total parking allowance for all but residential shall be designated as joint-use parking and shall be available at all times for use by the public for functions unrelated to the development. Such parking shall be located in an area easily accessible to the beach and shoreline, public walkway/bikeway and beach access routes.
3. Residential parking - for projects where on-street parking is available at a curb adjacent to the project, this parking will serve to satisfy a portion of the over-all requirement, but not to exceed fifteen percent (15%) of the total requirement.
4. Loading Space - off-street loading spaces shall be provided, located and scaled to meet the anticipated needs of the development. In general, off-street service areas shall be located in such a manner that there will be minimum interference with off-street parking, access and vehicular movement.

#### IV. SIGN REGULATIONS

The sign regulations as stated herein apply to all signs, whether permanent or temporary in nature, which are erected or intended to be erected in Tumon Bay. Signs to be erected in Tumon Bay must meet the criteria herein as well as that of the Government Code of Guam Chapter IX of Title XVIII and the Building Law.

##### Approvals

Erection of a sign or alteration of an existing sign requires approval of the Territorial Planning Commission. Preliminary sign plans will be approved by the Commission at the time of the Tumon Bay Development Application. Final approval must be obtained from Chief Planner prior to construction. Final plans shall include construction plans for the proposed sign and method of erection. Drawings shall show all exterior views including materials, lettering, colors, lighting, size and height.

Upon approval by the Commission and Chief Planner for the sign or signs requested, and before the start of any sign construction, applicant shall submit plans to the Building Official for issuance of a sign permit.

## Sign Area Calculation

The area of a sign shall include the entire area within a single, continuous perimeter enclosing the extreme limits of writing, graphic symbol, logo or art object, together with any structural frame or other material or color forming an integral part of the sign from the background against which it is placed. For free-standing signs (monument signs), the area of the sign permitted will be that allowable for each face of the sign. The supports or uprights on which the sign is placed are considered as part of the overall structure and area of the sign.

Signs shall be of permanent construction of a design, material, color, size and shape which is tasteful and relates to the character of the development and surrounding area. Moving, flashing and audible signs are not permitted. Luminous paints and reflective materials are not permitted. Plastic or acrylic signs are not permitted. Signs shall not be internally lighted. Indirect lighting of signs is encouraged.

## Sign Types

1. Free-Standing Sign - Self-supported and not attached to building or structure. Recommended where structures are set back from the street and for large complexes with several structures and activities. Includes portable and monument signs. Billboards and advertising signs not permitted in any form.
  - a. Not permitted in the public right-of-way or any easement.
  - b. Shall not disrupt pedestrian or vehicular traffic, their view or sight-lines.
  - c. Top edge of sign shall not project over 10 feet above the ground line. Area limitations shall be as specified for Sign Purpose.
  - d. Internally lighted signs are not permitted. Spot lighting and landscape lighting are encouraged.
  - e. Landscaping to complement the sign is mandatory.
  - f. Maximum of one sign allowed per development.
2. Building Sign - Mounted on a part of the exterior wall of a building or structure. This includes signs affixed to glass, trellises and other non-structural parts of the building. Roof mounted signs are not permitted.
  - a. Flush mounted signs or individual letters applied to the building are encouraged. Projecting or hanging signs and signs mounted on eaves and canopy fascia are discouraged.
  - b. Signs shall not project above building or wall on which mounted.
  - c. Interior signs attached to or within one foot of an exterior window and facing the public view are considered building signs.

## Sign Purposes

### 1. Identification Sign

#### a. Resort or commercial cluster sign.

- o name of complex only (individual business listing not allowed).
- o one ground sign or building sign permitted.
- o 24 square feet per sign face maximum.

#### b. Business Sign

- o information limited to name of business, building address, product or nature of business and graphic symbol, logo or art object related to business trademark.
- o one ground sign per lot or one building sign per building permitted.
- o total size of all signs not to exceed 3% of total building frontal area or 32 square feet, whichever is least.

#### c. Residential Sign

- o single family residence, one sign of 3 square feet maximum area, building mounted.
- o multi-family, one sign of 32 square feet to identify building and/or address, ground or building mounted.

#### d. Beach, Park or Recreational Area Sign

- o one sign per primary entrance permitted, ground sign not to exceed 24 square feet per sign face.
- o rules and regulations for use of recreation areas are excluded for these standards, subject to approval of the Department of Parks and Recreation.

### 2. Orientation Signs

#### a. Directional signs

- o to define entrance and exits, service and parking areas for large complexes.
- o ground signs permitted, maximum area per ground mounted sign to be 6 square feet.
- o number of signs to be determined based on need.

#### b. Directory sign

- o identification location of building and commercial activities in a large complex.
- o ground sign permitted.
- o to be located at the focal point for arriving traffic, but not to be visible from the street or serve as an identification sign.

- o maximum area to be 24 square feet.
    - o one allowed.
  - c. Traffic control signs and street signs are excluded subject to approval of Department of Public Works Highway Division.
  - d. Historic and interpretative signs are excluded subject to approval of the Guam Historic Preservation Officer.
- 3. Temporary Signs
  - a. Construction signs
    - o allowable only during the period of construction or renovation.
    - o renewal for 6 month periods based on need.
    - o information limited to the project/building name, tenant, owner/developer name, financier, architect/engineer and contractor.
    - o one ground sign or building sign permitted, maximum 24 square feet.
  - b. Announcement sign
    - o non-permanent building or ground sign to announce one-time activities and events.
    - o maximum area 8 square feet.
    - o sign permitted for a maximum period of one week.
  - c. Interim sign
    - o may be erected prior to completion of a permanent sign for a designated period not to exceed 60 days.
    - o shall comply with criteria for type, purpose and location stated herein.





**TUMON BAY DEVELOPMENT APPLICATION**

TUMON BAY DEVELOPMENT APPLICATION  
TERRITORIAL PLANNING COMMISSION  
AGANA, GUAM

To: Executive Secretary, TPC  
c/o Planning Division  
Department of Land Management  
Government of Guam

The undersigned, owner/lessor, of the following legally described property hereby requests your consideration for a use approval.

1. a. Name of Applicant: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
b. Developer of Project: \_\_\_\_\_  
c. Person or firm preparing design: \_\_\_\_\_
2. Location Description and Ownership:
  - a. Lot Number: \_\_\_\_\_
  - b. Registered Owner: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_
  - c. Certificate of Title No: \_\_\_\_\_ Recorded Document No: \_\_\_\_\_
  - d. Lot Area: \_\_\_\_\_ Square Meters \_\_\_\_\_ Square Feet
3. Land Use and Proposed Use:
  - a. Tumon Bay Master Plan Zone:  
\_\_\_\_\_  
\_\_\_\_\_
  - b. Existing Use:  
\_\_\_\_\_  
\_\_\_\_\_

- c. Proposed Use (describe specifically the nature and types of the uses requested and the net square foot areas for all proposed buildings and uses):

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- d. Future uses of lot areas not included in this application:

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4. Adherence to Mandatory Standards:

- a. Lot coverage ratios: \_\_\_\_\_ percent buildings  
\_\_\_\_\_ percent parking, access and service  
\_\_\_\_\_ percent outdoor, open space and landscaping

- b. Parking: automobile \_\_\_\_\_ required \_\_\_\_\_ actual  
bus \_\_\_\_\_ required \_\_\_\_\_ actual

- c. Deviations from setback-height requirements, if any:

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- d. Type and number of signs:

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- e. Type of stormwater disposal system:

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5. a. Describe compatability with resort image and relationship to surrounding land uses, natural features, shorelines and maintenance of views:

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- b. Improvements to government land or community facilities planned:

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- c. Accessibility to community assets including beach, recreation and open space:

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- d. Extent of preservation of existing vegetation and scope of new landscaping to be provided:

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- e. Impact on historical, archaeological or unique ecological sites and methods for mitigation:

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6. Approximate date for start of construction: \_\_\_\_\_

Completion of construction: \_\_\_\_\_

Incremental schedule for construction by phase or unit:

\_\_\_\_\_  
\_\_\_\_\_

7. Supporting information: Applicant shall submit twenty (20) copies of each item listed in the Submittal Requirements section of the Rules and Regulations. Additional information may be requested by the Chief Planner to fully describe the application.
8. Should this application be approved, it is understood that only that particular use described in this application and conditions set forth by the Territorial Planning Commission shall be authorized. All approvals of the Commission, with conditions, must be completed prior to issuance of an occupancy permit.
9. The applicant certifies that no less than three percent (3%) of the total construction cost for development and improvements will be expended on landscaping of the project. Allowable costs under this requirement include the costs for purchase of landscaping and vegetation, the labor involved in its planting, relocation, trimming and preservation of existing trees. Costs for covered ponding basins, grading and related improvements other than direct landscaping are not to be included. Applicant must submit final landscaping plans for approval of Chief Planner prior to start of construction on any part of the project.

I hereby certify that all information contained in this application and its supplements are true and correct. I also understand that any misrepresentation in this application will void the entire submission.

Date: \_\_\_\_\_

\_\_\_\_\_  
Applicant(s) Owner or Lessor

\_\_\_\_\_  
Representative

**APPENDIX C**

**TUMON BAY MASTER PLAN  
ENVIRONMENTAL DESIGN GUIDELINES  
FOR DEVELOPMENT**



## TUMON BAY MASTER PLAN ENVIRONMENTAL DESIGN GUIDELINES FOR DEVELOPMENT

Growth is welcome to Tumon Bay because it enhances economic benefits to the community. The Tumon Bay Master Plan describes the growth of the Tumon area from the viewpoint of the resident, the developer, and the visitor. The Plan provides for a variety of growth opportunities with emphasis on effective utilization of the beach and lagoon and through informal, low-key development which preserves the magnificent vistas and views. The Plan's goals to preserve a resort area composed of well-designed contemporary buildings, recreational opportunities, pedestrian activities and landscaping, all surrounded by the natural beauty of Tumon Bay. It describes an overall image of the area as a well planned, pleasant, and integrated resort which is lush, tropical, and serene.

To achieve this goal, people must work together, and development must occur in accordance with environmental guidelines. Each development, however individual or unique, must be seen as an integral part of an overall image.

In order to facilitate this resort image in future construction, the design relationship among proposed developments, the natural environment, and existing and proposed buildings and activities must be clearly administered. Because environmental preservation is central to resident satisfaction and tourism development, proposals for resort area development must be evaluated in light of the impact on and the benefits to the natural and manmade environment.

It is for this reason that these Guidelines are developed. They are simply intended to encourage new development which is appropriate to its setting and which conforms to a framework of comprehensive design principles. The Guidelines are not intended to be restrictive but rather to aid in improving the quality of the existing environmental principles which are essential to obtaining the desired visual order of Tumon Bay.

The Territorial Planning Commission has established these Guidelines to accomplish the following goals:

- \* reinforce the desired image of the area and protect its visual characteristics;
- \* improve the quality of growth and development;
- \* protect the value of public and private investment;
- \* serve as a tool for applicants and their designers to use in making basic development decisions; and
- \* provide an established basis for decisions of the Territorial Planning Commission.

These Guidelines make suggestions about ways to safeguard visual quality that designers and developers will find helpful. They are performance oriented. From the designers' point-of-view, responding to the Guidelines should be no more complicated than responding to site conditions, program requirements, budgets and other traditional design considerations.

## ENVIRONMENTAL DESIGN GUIDELINES

**OBJECTIVE I** Development shall be sited to respect natural features and maintenance of views.

**GUIDELINE No. 1** Development should promote existing scenic qualities of Tumon Bay.

Puntan Dos Amantes and ocean vistas should be captured.

Variation in natural coastline, coves, beaches and reef to be visually accessible.

Lagoon and beach activities should be featured visually.

Hillside topography and natural greenbelt to be retained.

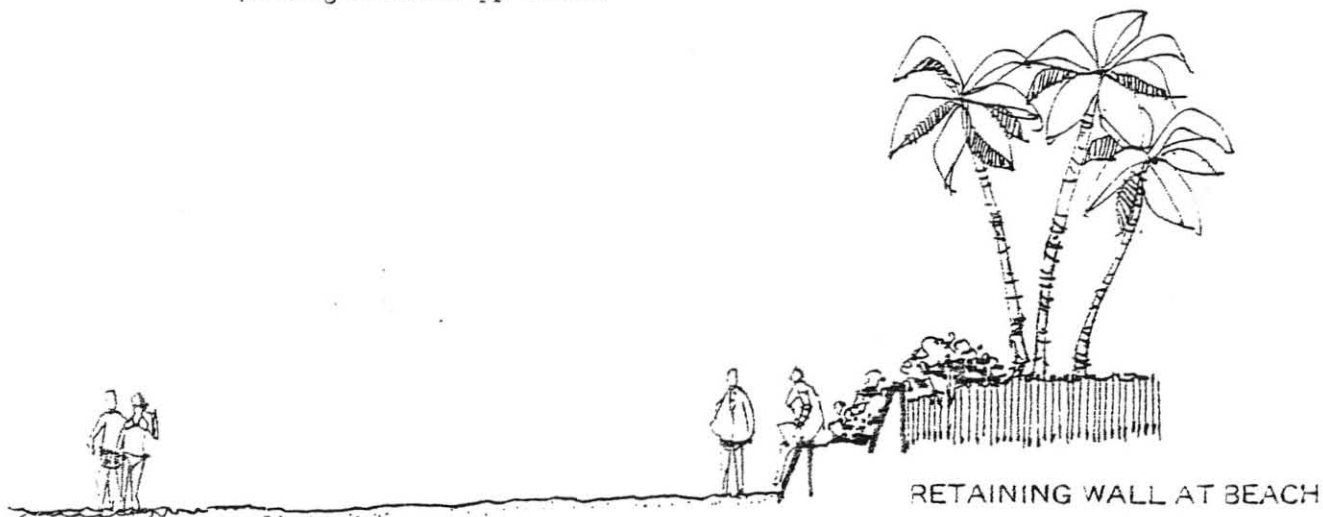
Views from the top of the hill (Marine Drive areas) should be utilized.

Areas of particular concern, unique ecological areas and significant stands of tropical vegetation should be preserved.

Views from San Vitores Road gateways and other key orientation points should be strengthened.

**GUIDELINE No. 2** Establish complimentary relationship with shoreline and lagoon.

Maintain continuity of land form, topography and transitions to beach. Minimize use of retaining walls, dikes and seawalls. Set back walk at the slope of 2-foot horizontal for each 1-foot vertical rise. Design walls to serve as bench use and provide planting to soften appearance.

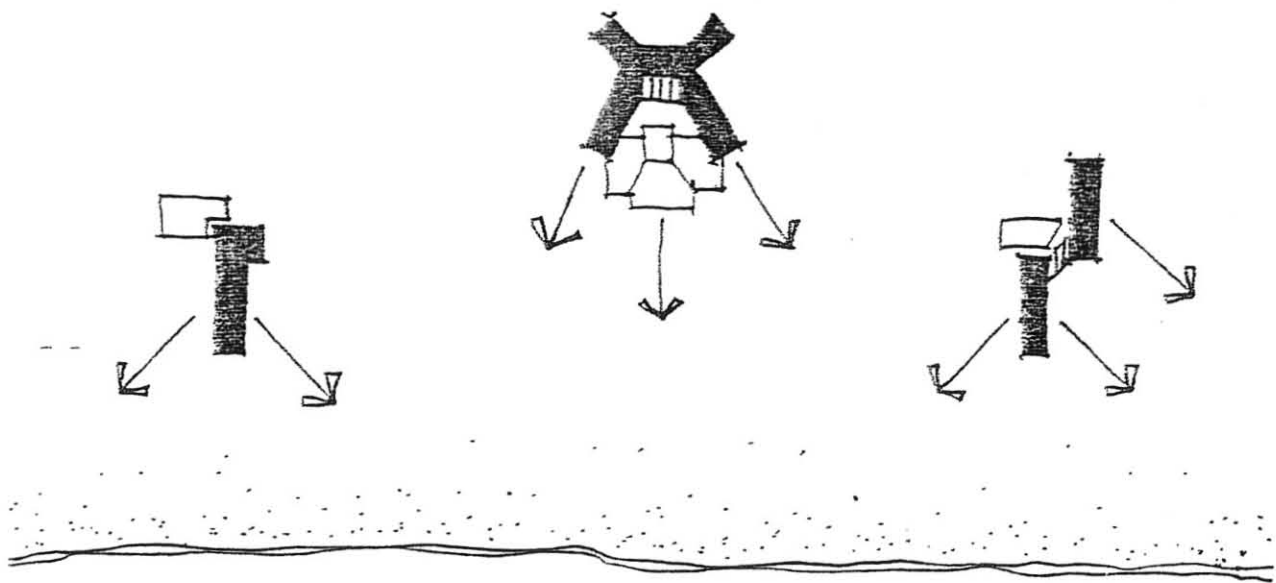


Relate to historic areas including Pale San Vitores Monument and Tumon Bay fortifications.

Avoid encroachment of building shadows on beach, recreational open space and community facilities.

Maintain, define and develop beach access points. Provide for continuous beach walkway and incorporate beach walk into shore development, including provision of benches, trash receptacles, low-level lighting and other conveniences. Public access to the beach should be established through pedestrian arcades and walkways.

Open-view channels to the Bay through the site. Orient buildings perpendicular to allow view corridors between buildings. Open buildings to allow view through at ground level.



Parking adjacent to shoreline areas is discouraged. Locate and screen views of parking to promote the natural beach setting.

Preserve stands of coconut palms and other mature trees. Clearing of low-level vegetation within and adjacent to the shoreline reserve is encouraged to enhance views and provide for the security of the public. Existing tall palm trees should not be damaged or removed.

**GUIDELINE NO. 3** Encourage accessibility to community assets which provide a sense of orientation, recognition and visual interest.

Maintain and improve quality of open space areas and access to them for recreational purposes. Open space provides a welcome contrast to the density of development and helps to define the character of the resort area.

Maintain and improve connections to community and recreation facilities.

Preserve dominance of San Vitores Road. Relate project visually and functionally to roadway and pedestrian walkway. Provide amenities such as rest areas, landscaping, provision of lighting and appropriate street furniture.

**OBJECTIVE II** Development should establish resort image through design of site improvements, structures and relationship to neighboring structures and open space.

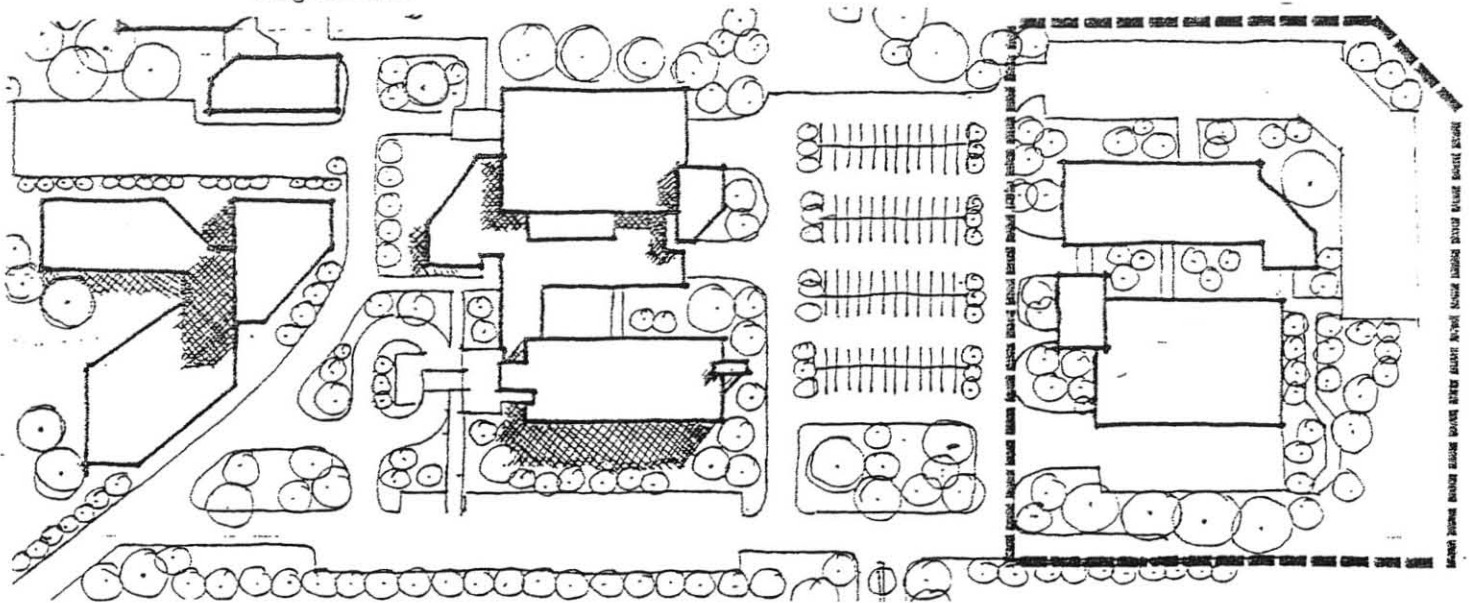
**GUIDELINE NO. 1** Development shall promote positive visual image and impression of resort character.

Resort environment should reflect a feeling of relaxation and leisure. The extensive building, congestion and activity of urban settings are discouraged.

Emphasize recreation, pedestrian activity and landscaped open space.

Consideration should be given to preservation and improvement of the natural beauty of the site with emphasis on open space, water features, the natural land form and vegetation.

Developments which encompass only a portion of a large lot should be supported by a master plan for development of the entire lot. This master plan should define the relationship of proposed and future development, open space, infrastructure, parking, service and building areas, and landscaping to ensure a coordinated planning scheme.



#### INTEGRATE FUTURE DEVELOPMENT WITHIN COMPREHENSIVE SITE MASTER PLAN

Consolidation of property into the largest possible parcel is encouraged. Subdivision of property into smaller parcels is discouraged unless justified by an overall master plan dealing with projected development of the basic lot.

GUIDELINE NO. 2 Promote continuity with adjacent areas.

Scale of development adjacent to the street shall relate to pedestrian scale.

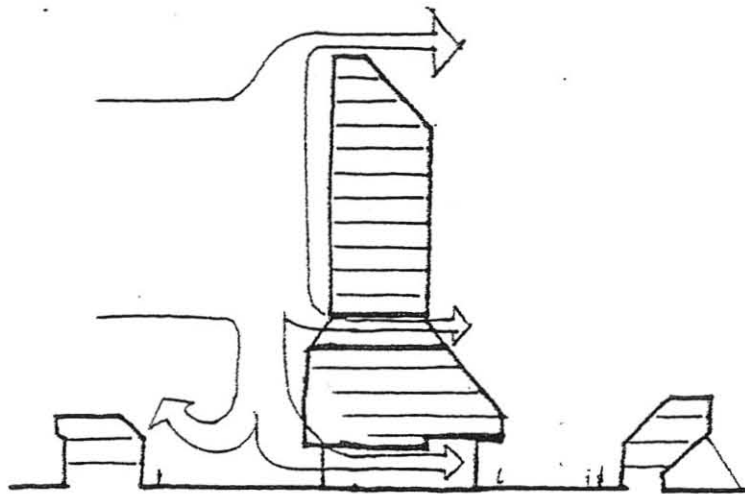
Provide variety of setback and exterior spaces separating adjacent developments.

Provide adequate open space as a component of the project.

Use special care in siting and massing of high density residential development where located adjacent to low density residential.

Effect of tall structures on natural air circulation and creation of wind turbulence should be considered. Building shadows should not interfere with neighboring activities.

A building significantly taller than its surroundings can experience high wind loads and concentrate pedestrian-level winds.



Provide unobtrusive parking, walkway and landscape lighting for safety and security purposes.

GUIDELINE NO. 3 Integrate infrastructure and service elements in an unobtrusive manner throughout the site.

The underground installation of power, telephone and television service within the site is encouraged.

Locate automobile and bus parking areas to rear of building whenever possible.

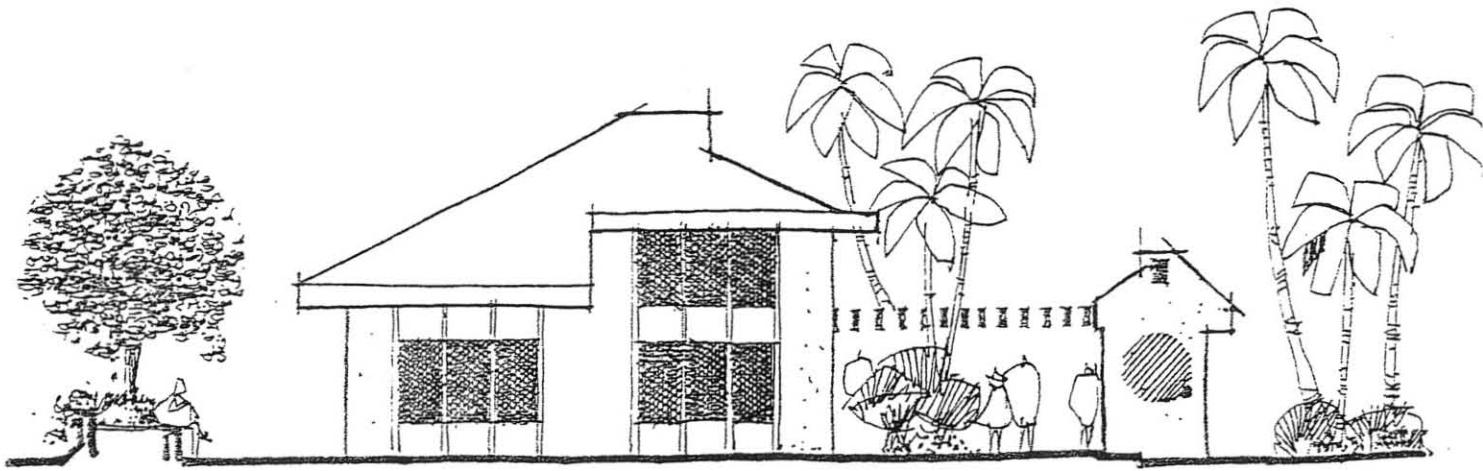
Screen parking at boundaries and break-up large paved areas with islands of landscaping.

OBJECTIVE III Building form, material, texture and color shall reflect tropical resort setting.

GUIDELINE NO. 1 Proportion and scale of buildings to relate to human scale.

Structure should not dominate adjacent street, pedestrian spaces and neighboring properties. Pedestrian viewpoint should relate to size and detail of building.

Transition between building scale and street scale through use of plazas, trellises, street furniture, landscaping and other outdoor elements relating to human scale.



Extend form and relieve massiveness and/or height of structures through use of transition elements. Ancillary structures such as entrance canopies, trellises, porches, stairs, terraces, plazas, gardens and other exterior spaces provide shade and inviting spaces while enhancing the human scale of buildings.

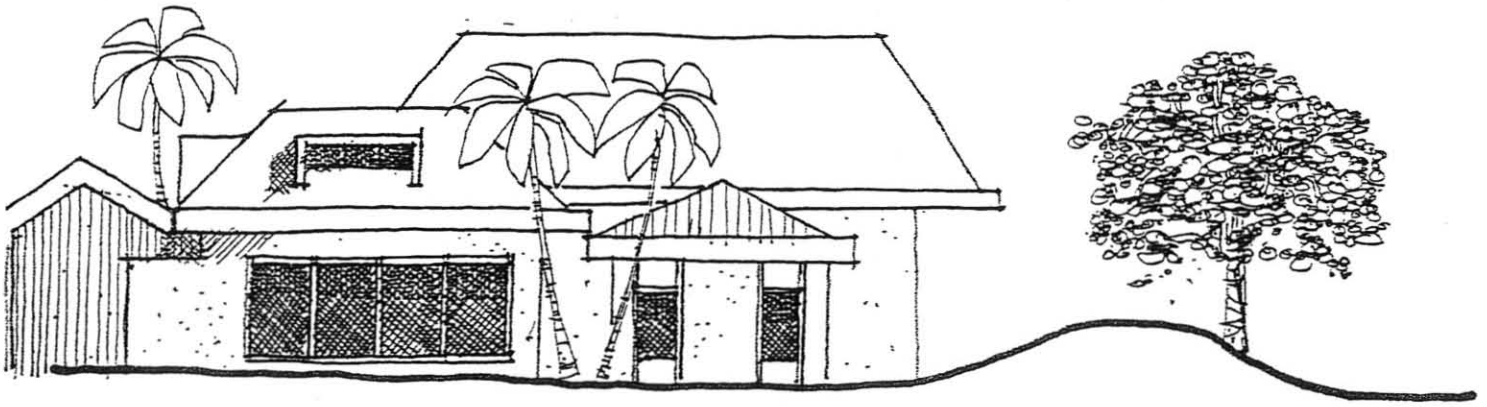
Soften bulk of structures by breaking into smaller components. Examples include use of several connected structures in lieu of one large imposing structure, as well as provision of lower ancillary buildings surrounding tower structures.

Vary wall plane, height and fenestration to provide an interesting configuration and silhouette.

Use roof forms which enhance overall scale and blend various forms.

Soften bulkiness of structures by use of landscaping incorporated within form of building.

Create hills and berms to integrate overall land and building forms. Utilize existing rock outcroppings, slopes and ridges to define character of development and promote natural setting.



Provide underground, covered or screened parking.

**GUIDELINE NO. 2 Use design elements to express function, use and tropical setting.**

Provide variety in building envelope, wall plane and roof shape. Break structure into related components with distinctive appearance.

Link buildings and activities together through use of vestibules covered passages, terraces and arcades.

Promote indoor-outdoor relationships. Public spaces can be open to the outside to allow for natural breezes and the experience of the tropical environment.

Utilize recessed entries as shaded transition.

Promote natural ventilation of spaces. Orient for maximum wind exposure. Provide breezeways to capture cooling breezes.

Give consideration to treatment of entry, windows, cornices and other building elements that contribute to style.

Balance uses of concrete and masonry with natural materials. Naturally weathering materials provide a pleasant appearance with minimum maintenance. Temporary structures such as mobile homes and pre-engineered steel buildings are not desirable for the long term appearance of the area.

Utilize distinctive ground texture for visual character and continuity.

The nature, size, shape, style and lighting of all signs should be in harmony with the resort setting. Signs should be subordinate to buildings and fit within existing features of the structure.



OBJECTIVE IV    Preserve existing mature trees and incorporate new landscaping to integrate development in natural setting.

GUIDELINE NO. 1    Protect existing landscaping, especially mature trees and planting.

Existing trees and groupings established in their natural condition should be retained and protected during construction.

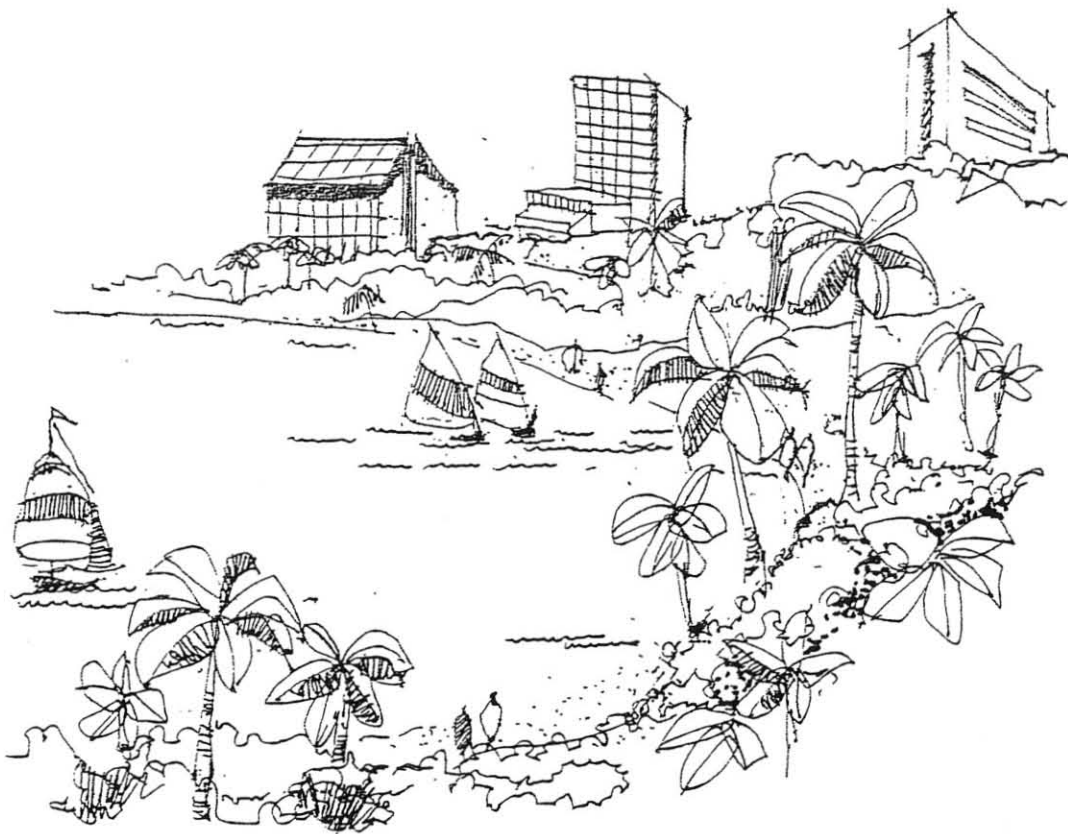
Selective thinning and removal are desirable to open specific vistas, to give shape and dimension to groupings, to create functional open space and to frame architectural elements.

Thin and shape existing vegetation for view, and to preserve mature trees.

Parking area layout should incorporate existing trees to the greatest extent possible.

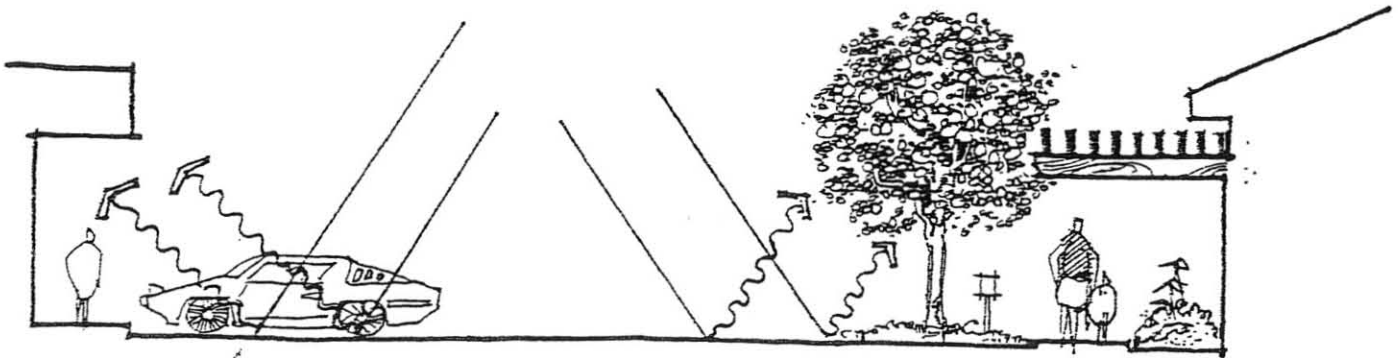
Buildings should be located with respect to preserving large stands of mature trees.

Maintain visual continuity of existing vegetation by replacing cleared areas with new landscaping.



## GUIDELINE NO. 2 Utilize landscaping as functional solutions.

Utilize landscaping for traffic and circulation control, to screen objected views of service and mechanical areas and to provide privacy.



Buffer and shade parking areas to provide relief from sun glare and reduce surface temperature of paved areas. Large paved areas are hot and uninteresting. Landscaping cools and shades parking.

Utilize landscaping to enhance building line and form, to unfold an attractive vista or frame a view. Islands of landscaping with a glimpse of the ocean may be more effective than a sweeping panorama of horizon.

Utilize landscaping to shade, cool and direct breezes, to absorb unpleasant sounds, smells and dust and as erosion control on steep banks.

In some cases, planting itself becomes a focal point of development. Large planting groups are strong determinants of spatial form.

Provide other landscape elements including rock forms, water and sculpture.

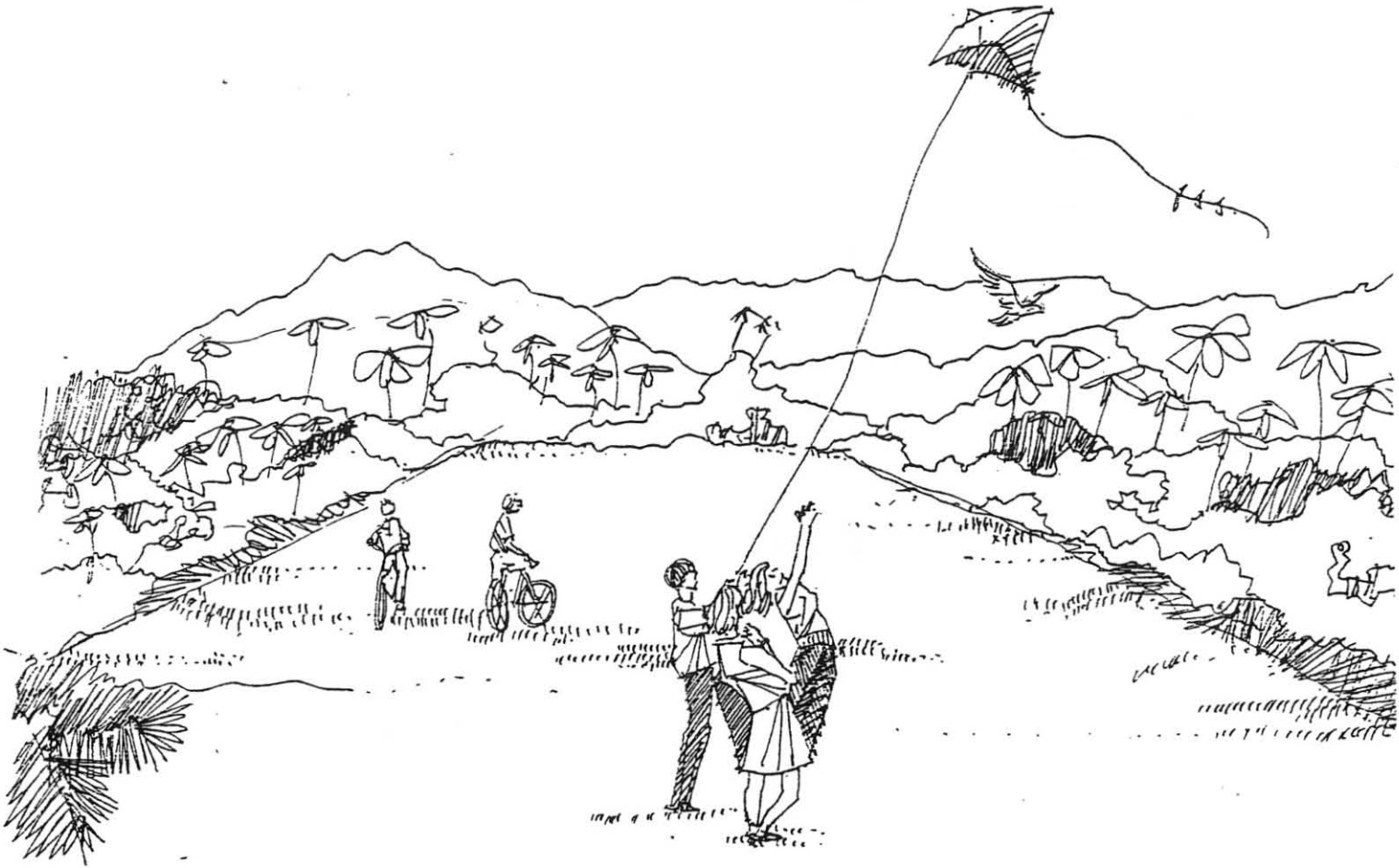
Landscape stormwater percolation areas to ensure attractive and maintained open space.

## GUIDELINE NO. 3 Utilize informal landscaping techniques to enhance the natural setting of the resort area.

Irregularity and naturalness should be created by planting to blend with natural land forms.

Open space should be provided in key locations in order to maintain existing views.

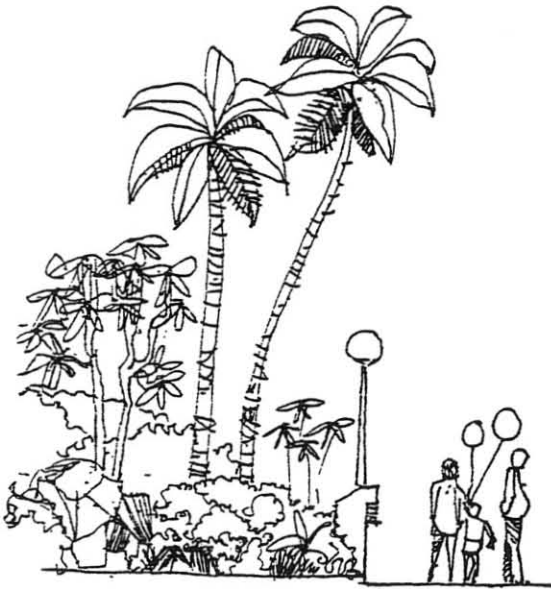
Utilize green areas for on-site disposal of stormwater runoff. Landscaped percolation trenches, covered ponding basins, recreation and open space areas and areas of natural vegetation will provide capacity for recharge of storm runoff. Covered ponding area can be used as recreation open space.



Adequate lighting should be provided at outdoor areas. Lighting should have a precisely defined purpose and not be disruptive to the adjacent surroundings or overall environment. Light poles should be no more than 15 feet in height, with underground electrical service.

Screen service and mechanical areas.

Plant in mass. Trees and major planting should be grouped into clusters forming simple landscaping elements.



Consider seasonal variation of color, loss of leaves and susceptibility to pest attack. Transient floral aspects, no matter how striking, should not be the sole basis of selection unless the specimen is also sound when not in flower.

Landscape lighting shall be low level. Underlighting of planting can serve also as walkway lighting. Limit spotting to specimen trees and dominant landscape forms.

**OBJECTIVE V** Scenic and natural features are key elements in the distinctive visual setting of the Tumon Bay resort area. Primary views and vistas are satisfying aesthetically, while functioning as physical orientation elements and image promotions for Guam as a tropical resort.

**GUIDELINE NO. 1** Protect and enhance view types which contribute to the scenic character of Tumon Bay. These include the following.

- Ocean-horizon panorama
- Enclosed shoreline, lagoon and reef
- Protruding shorelines
- Landmarks such as Puntan Dos Amantes & Satpon Point
- Distinctive land forms
- Encircling hillsides and ridges
- Recreational open space
- Conservation open space
- Historic and cultural features

Provide for variation in views from location to location in response to orientation, topography, land form, elevation, vegetation and adjacent development.

Evaluation of view development should recognize the distinctly different views of the area from outside and from entry points, as well as those views from within.

Provide for variety in views such as panoramic and continuous views (expansive, uninterrupted vistas, scenic in character), intermittent and focal views (channeled views of visual features, natural or man-made environmental) and shortened views (limited views of landscaping, improvements and pedestrians activity).

**GUIDELINE NO. 2** Preserve the visual character of the shoreline, and lagoon and beaches.

Promote the continued openness of the shoreline and the expansive views along the natural coastline.

Incorporate visually those activities which occur in relationship to these elements and which contribute to the tropical resort environment.

**GUIDELINE NO. 3** Resort development shall blend with the natural assets of the area.

Taller structures should be precisely located and oriented so as to capture views while not detracting from the quality of views for structures farther inland.

Development located adjacent to the shoreline should be low in height to blend with natural vegetation and to provide an acceptable transition in scale to the beach. Where hotel towers occur, they should be set back and oriented to provide a minimum interruption of the shoreline view.

Development adjacent to San Vitores Road and extending to the base of the hillside (predominantly tourist commercial or low scale residential) should relate to San Vitores Boulevard, neighboring development and site amenities.

Development occurring at the base and along the hillside may be high-rise construction to take advantage of view of the Bay over the low-rise residential and commercial development and provide for a positive visual silhouette against the backdrop of the hillside greenbelt.

**GUIDELINE NO. 4** Development shall be located in a manner to ensure that important vistas and view corridors are available to all properties.

Although building heights are not restricted in most cases, it is important that development maintain existings views and sightlines to enhance these views.

Vistas, view planes and view channels should be maintained in relationship to terrain and landmarks.

Views should be available to pedestrian and vehicular traffic at specific points along San Vitores Boulevard. These include views of the ocean and other natural features as well as those views of development itself. Conceived as a scenic boulevard, San Vitores will frame and strengthen these views while providing a pleasant foreground.

**OBJECTIVE VI** The Tumon Bay hillside and the Tumon Bay Areas of Natural Significance should be treated as areas of particular concern in the planning and design of development.

**GUIDELINE NO. 1** Intensity of development shall not disrupt topographic integrity of the hillside as a whole.

Slopes shall be developed in a manner to prevent erosion and siltation of adjacent properties. Provide for control and disposal of stormwater runoff.

Ensure continued stability of slopes. A Soil Investigation Report and earthwork recommendations shall be prepared where grading, cut or fill is proposed.

Slope protection shall be provided where erosion is possible. Landscaping and revegetation planting shall be included in initial project scope.

Development shall provide transition in grade to adjacent properties and shall not be disruptive to present or future use of these properties.

Roads, drives, walks and other travelways shall relate to overall hillside topography.

**GUIDELINE NO. 2** Sightlines and viewplanes shall be protected.

Development shall not penetrate sightlines from property located at top of the hill.

The view from adjacent properties shall not be blocked or restricted.

**GUIDELINE NO. 3** The existing natural character of the hillside shall be retained as a reference point, image and backdrop for the Tumon area.

The existing topographic and greenbelt character shall be preserved.

Transition in shape and scale shall promote integration of development in the overall hillside setting. Open space shall be provided between developments to minimize the overall silhouette of the development against hillside.

Removal of vegetation shall be minimized and revegetation shall be undertaken as a part of the development.

**GUIDELINE NO. 4** Intensity of development shall reflect the constraints and limitations of the hillside environment.

Minimum lot size for residential development shall be one-half acre.

Land coverage shall allow 50-percent of the lot to remain as open space. Open space shall be located to maximize the continued natural character of the hillside.

Building setbacks may be relaxed at the viewside and hillside portion of the site but shall be strictly enforced at the sideyards.

GUIDELINE NO. 5 Areas of Natural Significance should be developed with special consideration to their inherent environmental character.

Where these areas provide a buffer between two significantly different land uses the development should provide for a gradual transition.

The existing vegetation should be preserved in mass to the greatest extent possible, even at the expense of setback, height and parking requirements of the land use zone.

Informal, low-density public use should be accommodated by projects in these areas wherever possible.

The Government of Guam should utilize every resource and tool at its disposal to cooperate with developers of these areas in order to preserve the existing environmental character to the maximum extent possible.



**APPENDIX D**

**TUMON BAY MASTER PLAN  
ENVIRONMENTAL REVIEW COMMITTEE**

APPENDIX D  
TUMON BAY MASTER PLAN  
ENVIRONMENTAL REVIEW COMMITTEE

To aid in the interpretation and application of the development standards and to assist the Territorial Planning Commission in determining whether a proposed design is compatible according to the criteria set by the development guidelines, the Tumon Bay Environmental Review Committee (ERC) is established.

The role of the ERC is to review site planning, subdivision, civil design, exterior architecture and landscape architectural design at the time of application for development approval. Suggestions from the ERC will be treated in the same manner as those from the Subdivision and Development Review Committee (SDRC) and will be incorporated in final approvals at the discretion of the Territorial Planning Commission and Territorial Seashore Protection Commission. ERC and SDRC reviews should occur simultaneously.

Although it may be desirable that the ERC be established with the authority to provide approval on an autonomous basis (with TPC approval contingent upon approval of the ERC application), it is more effective in terms of existing administrative procedures to establish the ERC under the umbrella of TPC. As an advisor to the Territorial Planning Commission, the ERC will not add an additional layer of bureaucratic approvals, nor will it assume prerogatives that more appropriately lie with the Territorial Planning Commission.

Specific functions of the Environmental Review Committee include the following.

- a. Screening of applications to ensure that all material necessary for evaluation is included with the application. The format for submittals are included in the final Tumon Bay Rules and Regulations for Development. The Committee, as well as the Commission, must have the information they need to make an objective decision, and it is incumbent upon the applicants to justify their proposal/solution. This is similar to the submittal requirements for Planned Unit Developments, and the submittal criteria must be consistent. The ERC should not hesitate to request additional information or studies they consider essential to the concise evaluation of the applications, even if this entails a slight delay in application processing.
- b. The Committee should discourage obviously inappropriate applications and request resubmittal of more appropriate design and planning solutions.
- c. The Committee should provide interpretation of the Environmental Design Guidelines in terms of the specific goals of the resort area. This should not be overly structured, especially where it would result in predetermined solutions.
- d. The Committee should meet with applicants to discuss areas where the proposed development does not conform to the Guideline objectives and to negotiate corrective or alternative solutions. The committee should not hesitate to make suggestions which will serve to further integrate the development within the resort/tropical environment desired. It should be remembered, however, that the Committee is not to design the project.

- e. The Committee should evaluate new or innovative solutions, provision of desirable amenities or inclusion of trade-offs which will result in an acceptable environmental solution. Again, the burden of proof lies with the applicant to justify his proposal. The Committee must continually recognize the need to be open-minded and flexible.
- f. The Committee should recognize developer economics and should be willing to work with the applicant to develop acceptable solutions within reasonable cost parameters. The applicant must also recognize his responsibility to provide a project which meets the standards established for the resort area. This involves a commitment to environmental harmony which is unique to the Tumon Bay area.
- g. The Committee shall provide written comments relative to their review, application deficiencies, suggestions and alternate proposals and final committee recommendations. When at all possible, differences between the applicant and the Committee should be resolved at the Committee level. Although it is not desirable that the Territorial Planning Commission or Territorial Seashore Protection Commission arbitrate areas where the applicant disagrees with ERC recommendations, it is critical that the ERC present in detail all their findings to the Commissions such that the Commissions will have facts representing both sides of the argument at the time they make their final decision.

The ERC is intended as a citizen advisory committee and its members will be volunteers representing a cross-section of disciplines and viewpoints. Composition of the Committee will be as follows.

1. Chief Planner, Department of Land Management in his capacity as liaison to the Territorial Planning and Territorial Seashore Protection Commissions.
2. Planner representing the Bureau of Planning as coordinator of the overall master plan for the Tumon Bay resort area.
3. Landscape Architect or Architect with experience in the design and construction of site development and landscaping projects on Guam.
4. Architect with experience in the design of site development and buildings on Guam.
5. Community representative with an understanding of the tourist industry on Guam and the mechanics of project development.

It is proposed that ERC members be appointed by the Governor for staggered terms of two-year duration. Legislative concurrence is not anticipated due to the advisory nature of the Committee.

**APPLICATION RECORD & CHECKLIST**  
**FOR**  
**TUMON BAY DEVELOPMENT**  
(For use by Department of Land Management)

1. **Environmental Review Committee evaluation:**  
**Comments:**

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2. **Subdivision and Development Review Committee evaluation:** \_\_\_\_\_ **date.**  
**Comments:**

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3. **Public Hearing if applicable:** \_\_\_\_\_ **date.**

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4. **Supplemental Department of Land Management comments:**

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5. Territorial Planning Commission Hearing: \_\_\_\_\_ date.  
Action:

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Conditions:

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Time period: \_\_\_\_\_

Extensions and date granted: \_\_\_\_\_

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6. Final landscaping plan submittal: \_\_\_\_\_ date.

\_\_\_\_\_ Estimated value of landscaping (3% of total construction value)

\_\_\_\_\_ Screening and shading of parking areas and adjacent property.

\_\_\_\_\_ Diversity of plant materials.

\_\_\_\_\_ Retention of natural vegetation.

\_\_\_\_\_ Satisfactory percentage of mature specimens.

\_\_\_\_\_ Landscaping adjacent to roadways and public access.

\_\_\_\_\_ Landscaping of government land.

\_\_\_\_\_ Landscaping at beach.

\_\_\_\_\_ Landscaping of stormwater disposal areas.

\_\_\_\_\_ Other conditions (list)

7. Performance Bond submittal: \_\_\_\_\_ date.

Amount: \_\_\_\_\_

Released by TPC: \_\_\_\_\_

8. Land Management Clearance for building permit: \_\_\_\_\_ date.

Conditions:

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9. Completion of construction: \_\_\_\_\_

Certification by Building Permit official: \_\_\_\_\_ date.

Conditions:

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Released by TPC \_\_\_\_\_ date.

**APPENDIX E**

**TUMON BAY MASTER PLAN  
PROPOSED LEGISLATION**



APPENDIX E

AN ACT RELATIVE TO THE APPROVAL OF THE TUMON BAY MASTER  
PLAN, THE CREATION OF ZONES FOR TUMON BAY AND THE  
REZONING OF LAND IN TUMON BAY

WHEREAS, the objectives of the Comprehensive Master Plan are delineated in Section 62011 of the Government Code; and

WHEREAS, Section 62011 of the Government Code calls for legislation to regulate land use for the protection of future generations; and

WHEREAS, it has been recommended, through Bill No. 919 and Bill No. 920 introduced in the Thirteenth Guam Legislature and reintroduced as Bill No. 233 and Bill No. 234 in the Fourteenth Guam Legislature that a new "H" Resort-Hotel Zone be created; and

WHEREAS, P.L. 14-41 enacted that "H" Resort-Hotel Zone in Tumon Bay; and

WHEREAS, P.L. 15-132 subsequently authorized the formulation of a comprehensive master plan for Tumon Bay to be approved by the Governor and Legislature; and

WHEREAS, Resolution No. 300, Seventeenth Guam Legislative (First Regular Session) adopted the Tumon Bay Master Plan as approved by the Governor of Guam and transmitted to the Guam Legislature on January 27, 1983; and

WHEREAS, P.L. 17-86 requires that certain amendments be incorporated into the Tumon Bay Master Plan; and

WHEREAS, the Master Plan has been revised, as required, and such Plan recommends a rezoning of the "H" Resort Zone in Tumon Bay into new zones;

NOW, THEREFORE, BE IT ENACTED BY THE PEOPLE OF THE TERRITORY OF GUAM:

Section 1. Section 17111, Guam Code, is hereby repealed and re-enacted to read as follows:

"17111 Notwithstanding any other provisions of the law there are hereby created the following land use zones for Tumon Bay.

17111.1 Tumon Bay Resort Zone

Permitted Uses

1. Hotel buildings and hotel-condominiums containing 10 or more rooms intended or designed to be used, or which are used, rented or leased-out to be occupied, or which are occupied for sleeping purposes.
2. Any retail business catering primarily to tourists, except those selling adult merchandise, including those which are: a) master planned in conjunction with a hotel; or b) within the hotel or hotel-condominium structure, including banking facilities, personal service shops, restaurants and cafes and establishments with or without license to sell alcoholic beverages; or c) unassociated with a hotel.
3. Restaurants, cafes and establishments with or without license to sell alcoholic beverages.
4. Parking

17111.2 Tumon Bay Tourist Commercial Zone

Permitted Uses

1. Retail stores, shops and businesses catering primarily to tourist services.
2. Amusement enterprises.
3. Offices, business or professional, and banks.
4. Personal service shops.
5. Restaurants, cafes and establishments with or without license to sell alcoholic beverages.
6. Adult merchandise shops.
7. Parking.
8. Other uses which, in the judgment of the Commission, as evidenced by resolution in writing, are similar to or in support of those listed herein.
9. Accessory structures for the above.

17111.3 Tumon Bay Residential Zone

Permitted Uses

1. One-Family dwellings.
2. Duplexes.
3. Multi-family dwellings.
4. Gardening and the keeping of pets for non-commercial purposes.
5. Uses customarily accessory to any of the above uses including home occupations and private parking areas with accessory buildings and structures.
6. Schools and churches.
7. Parks, playgrounds and community centers.
8. Health service offices, outpatient with laboratory.
9. Utilities and public facilities.
10. Accessory uses and structures for the above.
11. Other uses which, in the judgment of the Commission, as evidenced by resolution in writing, are similar to or in support of those listed herein."

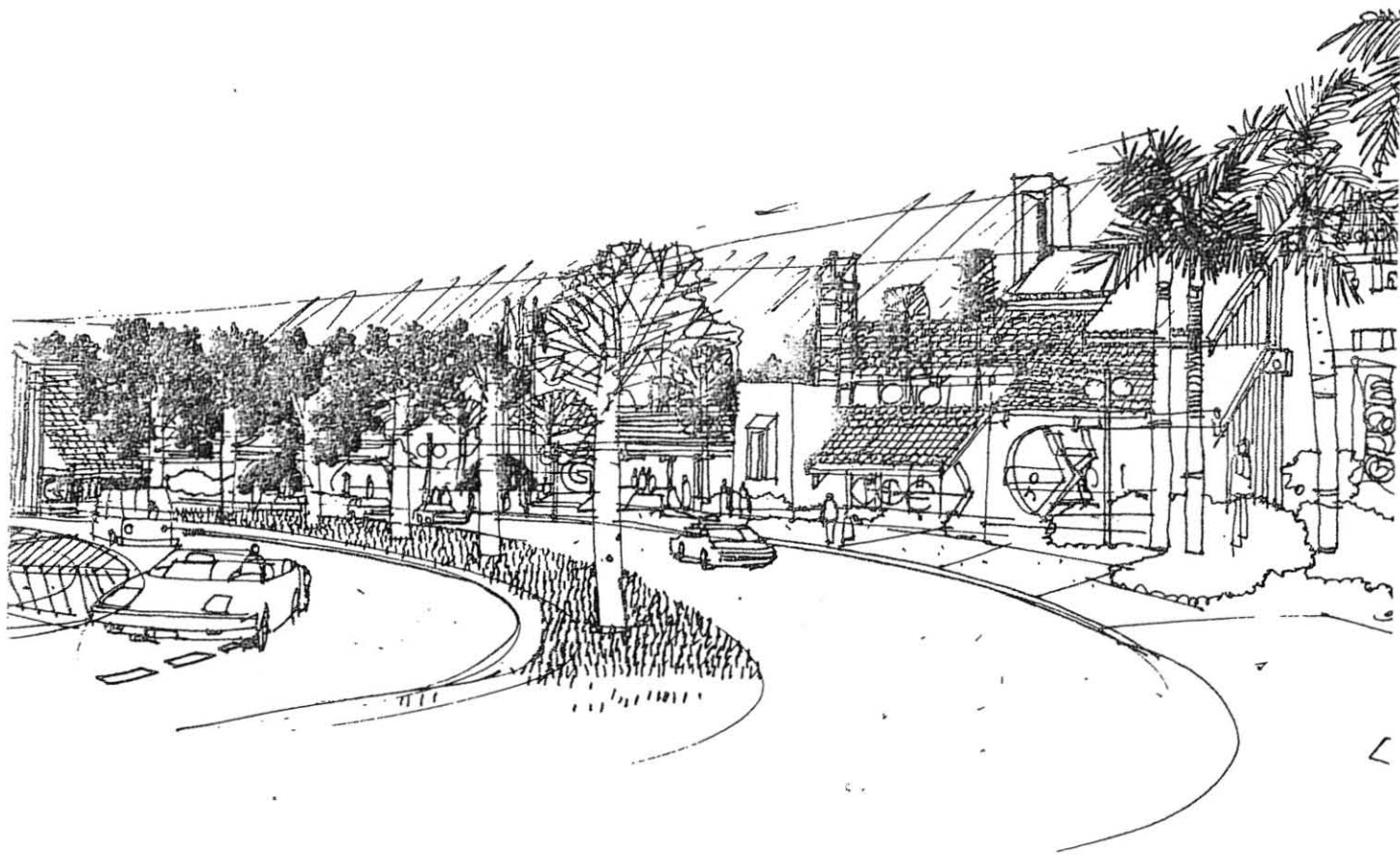
Section 3. Section 17054, Guam Code, is hereby added to the Government Code to read as follows:

"17054. All land within Tumon Bay as described by the Tumon Bay Master Plan, dated 1985, shall be zoned in accordance with the Tumon Bay Master Plan Use Map at the effective date of this Act."

Section 4. Any property owner who exercised the option to exempt his property from the "H" Resort-Hotel Zoning, pursuant to the procedure authorized by Section 3 of P.L. 14-41, shall not be affected by the new zones enacted through Section 2 and Section 3 of this Act.



# Tumon Bay Master Plan Environmental Design Guidelines for Development



GOVERNMENT OF GUAM

Agaña, Guam

1985



## TUMON BAY MASTER PLAN ENVIRONMENTAL DESIGN GUIDELINES FOR DEVELOPMENT

Growth is welcome to Tumon Bay because it enhances economic benefits to the community. The Tumon Bay Master Plan describes the growth of the Tumon area from the viewpoint of the resident, the developer, and the visitor. The Plan provides for a variety of growth opportunities with emphasis on effective utilization of the beach and lagoon and through informal, low-key development which preserves the magnificent vistas and views. The Plan's goals to preserve a resort area composed of well-designed contemporary buildings, recreational opportunities, pedestrian activities and landscaping, all surrounded by the natural beauty of Tumon Bay. It describes an overall image of the area as a well planned, pleasant, and integrated resort which is lush, tropical, and serene.

To achieve this goal, people must work together, and development must occur in accordance with environmental guidelines. Each development, however individual or unique, must be seen as an integral part of an overall image.

In order to facilitate this resort image in future construction, the design relationship among proposed developments, the natural environment, and existing and proposed buildings and activities must be clearly administered. Because environmental preservation is central to resident satisfaction and tourism development, proposals for resort area development must be evaluated in light of the impact on and the benefits to the natural and manmade environment.

It is for this reason that these Guidelines are developed. They are simply intended to encourage new development which is appropriate to its setting and which conforms to a framework of comprehensive design principles. The Guidelines are not intended to be restrictive but rather to aid in improving the quality of the existing environmental principles which are essential to obtaining the desired visual order of Tumon Bay.

The Territorial Planning Commission has established these Guidelines to accomplish the following goals:

- \* reinforce the desired image of the area and protect its visual characteristics;
- \* improve the quality of growth and development;
- \* protect the value of public and private investment;
- \* serve as a tool for applicants and their designers to use in making basic development decisions; and
- \* provide an established basis for decisions of the Territorial Planning Commission.



These Guidelines make suggestions about ways to safeguard visual quality that designers and developers will find helpful. They are performance oriented. From the designers' point-of-view, responding to the Guidelines should be no more complicated than responding to site conditions, program requirements, budgets and other traditional design considerations.

## ENVIRONMENTAL DESIGN GUIDELINES

**OBJECTIVE I** Development shall be sited to respect natural features and maintenance of views.

**GUIDELINE No. 1** Development should promote existing scenic qualities of Tumon Bay.

Puntan Dos Amantes and ocean vistas should be captured.

Variation in natural coastline, coves, beaches and reef to be visually accessible.

Lagoon and beach activities should be featured visually.

Hillside topography and natural greenbelt to be retained.

Views from the top of the hill (Marine Drive areas) should be utilized.

Areas of particular concern, unique ecological areas and significant stands of tropical vegetation should be preserved.

Views from San Vitores Road gateways and other key orientation points should be strengthened.

**GUIDELINE No. 2** Establish complimentary relationship with shoreline and lagoon.

Maintain continuity of land form, topography and transitions to beach. Minimize use of retaining walls, dikes and seawalls. Set back walk at the slope of 2-foot horizontal for each 1-foot vertical rise. Design walls to serve as bench use and provide planting to soften appearance.

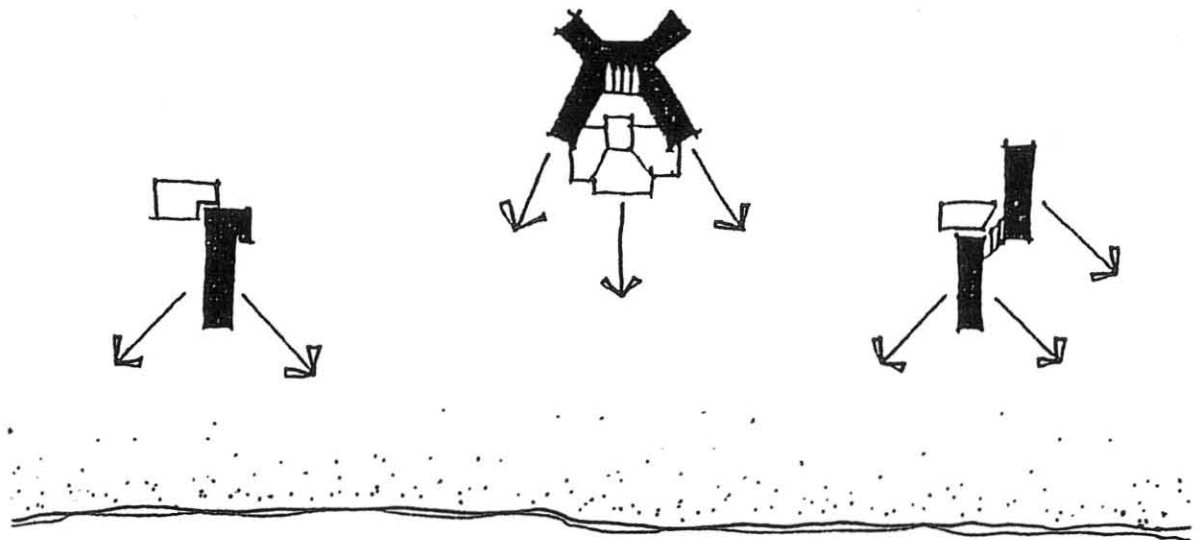


Relate to historic areas including Pale San Vitores Monument and Tumon Bay fortifications.

Avoid encroachment of building shadows on beach, recreational open space and community facilities.

Maintain, define and develop beach access points. Provide for continuous beach walkway and incorporate beach walk into shore development, including provision of benches, trash receptacles, low-level lighting and other conveniences. Public access to the beach should be established through pedestrian arcades and walkways.

Open-view channels to the Bay through the site. Orient buildings perpendicular to allow view corridors between buildings. Open buildings to allow view through at ground level.



Parking adjacent to shoreline areas is discouraged. Locate and screen views of parking to promote the natural beach setting.

Preserve stands of coconut palms and other mature trees. Clearing of low-level vegetation within and adjacent to the shoreline reserve is encouraged to enhance views and provide for the security of the public. Existing tall palm trees should not be damaged or removed.

**GUIDELINE NO. 3** Encourage accessibility to community assets which provide a sense of orientation, recognition and visual interest.

Maintain and improve quality of open space areas and access to them for recreational purposes. Open space provides a welcome contrast to the density of development and helps to define the character of the resort area.

Maintain and improve connections to community and recreation facilities.

Preserve dominance of San Vitores Road. Relate project visually and functionally to roadway and pedestrian walkway. Provide amenities such as rest areas, landscaping, provision of lighting and appropriate street furniture.

**OBJECTIVE II** Development should establish resort image through design of site improvements, structures and relationship to neighboring structures and open space.

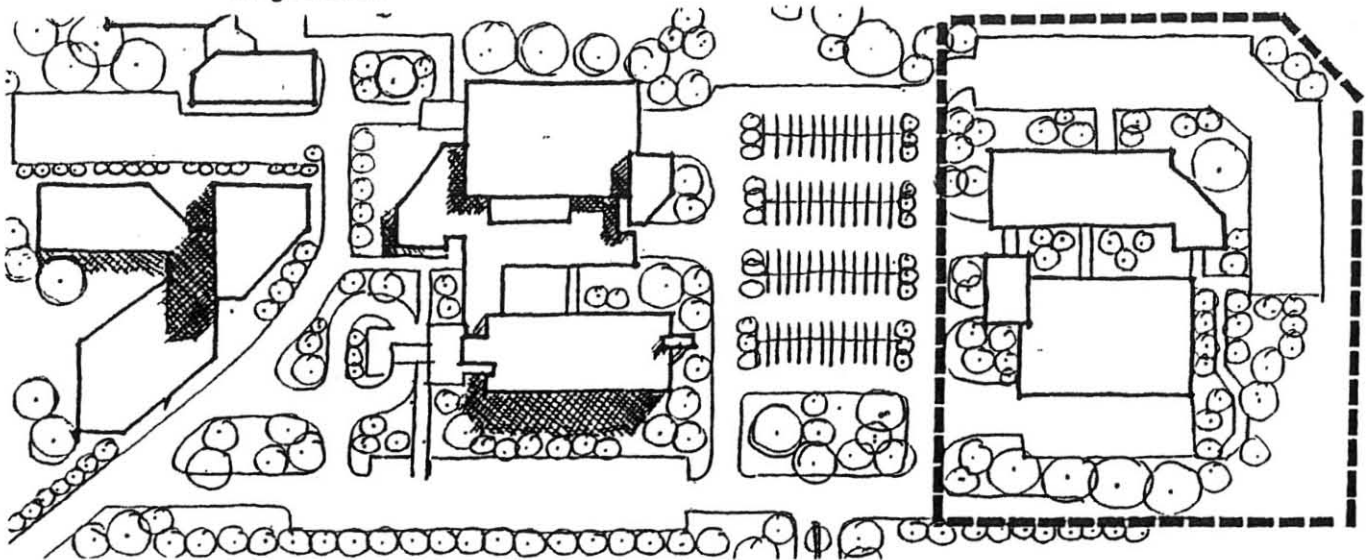
**GUIDELINE NO. 1** Development shall promote positive visual image and impression of resort character.

Resort environment should reflect a feeling of relaxation and leisure. The extensive building, congestion and activity of urban settings are discouraged.

Emphasize recreation, pedestrian activity and landscaped open space.

Consideration should be given to preservation and improvement of the natural beauty of the site with emphasis on open space, water features, the natural land form and vegetation.

Developments which encompass only a portion of a large lot should be supported by a master plan for development of the entire lot. This master plan should define the relationship of proposed and future development, open space, infrastructure, parking, service and building areas, and landscaping to ensure a coordinated planning scheme.



**INTEGRATE FUTURE DEVELOPMENT WITHIN COMPREHENSIVE  
SITE MASTER PLAN**

Consolidation of property into the largest possible parcel is encouraged. Subdivision of property into smaller parcels is discouraged unless justified by an overall master plan dealing with projected development of the basic lot.

**GUIDELINE NO. 2 Promote continuity with adjacent areas.**

Scale of development adjacent to the street shall relate to pedestrian scale.

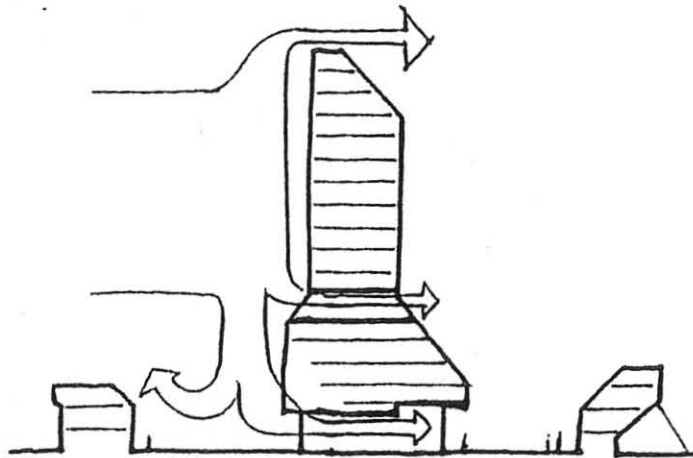
Provide variety of setback and exterior spaces separating adjacent developments.

Provide adequate open space as a component of the project.

Use special care in siting and massing of high density residential development where located adjacent to low density residential.

Effect of tall structures on natural air circulation and creation of wind turbulence should be considered. Building shadows should not interfere with neighboring activities.

A building significantly taller than its surroundings can experience high wind loads and concentrate pedestrian-level winds.



Provide unobtrusive parking, walkway and landscape lighting for safety and security purposes.

**GUIDELINE NO. 3 Integrate infrastructure and service elements in an unobtrusive manner throughout the site.**

The underground installation of power, telephone and television service within the site is encouraged.

Locate automobile and bus parking areas to rear of building whenever possible.

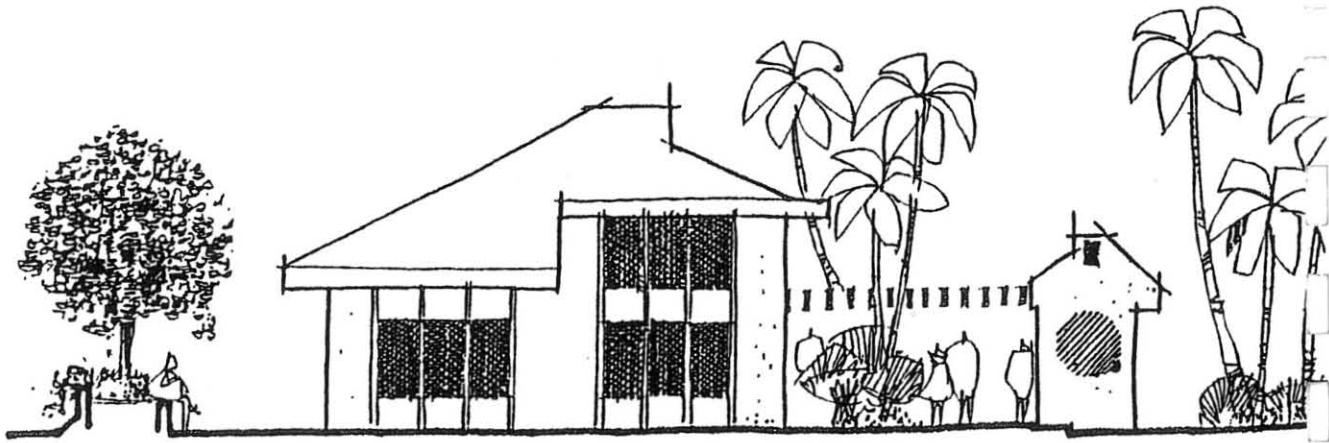
Screen parking at boundaries and break-up large paved areas with islands of landscaping.

**OBJECTIVE III** Building form, material, texture and color shall reflect tropical resort setting.

**GUIDELINE NO. 1** Proportion and scale of buildings to relate to human scale.

Structure should not dominate adjacent street, pedestrian spaces and neighboring properties. Pedestrian viewpoint should relate to size and detail of building.

Transition between building scale and street scale through use of plazas, trellises, street furniture, landscaping and other outdoor elements relating to human scale.



Extend form and relieve massiveness and/or height of structures through use of transition elements. Ancillary structures such as entrance canopies, trellises, porches, stairs, terraces, plazas, gardens and other exterior spaces provide shade and inviting spaces while enhancing the human scale of buildings.

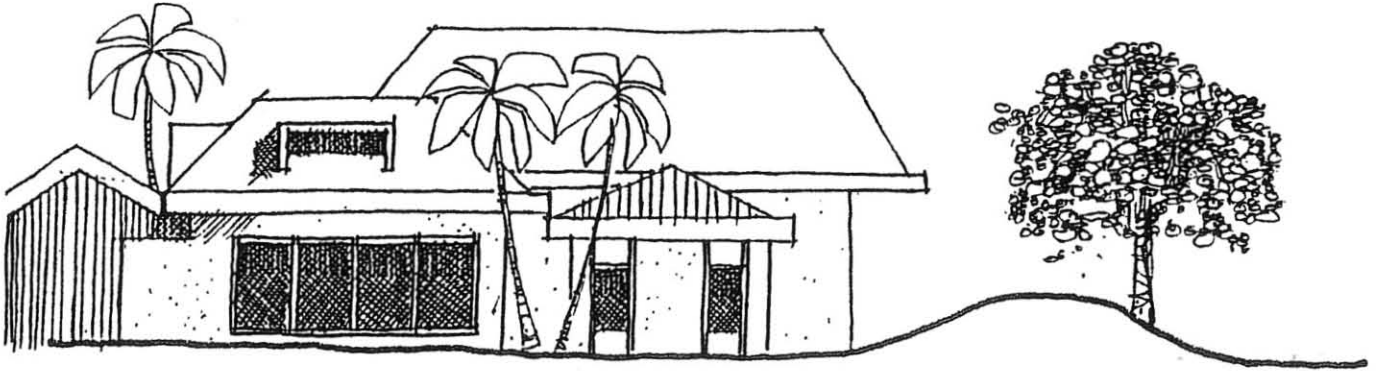
Soften bulk of structures by breaking into smaller components. Examples include use of several connected structures in lieu of one large imposing structure, as well as provision of lower ancillary buildings surrounding tower structures.

Vary wall plane, height and fenestration to provide an interesting configuration and silhouette.

Use roof forms which enhance overall scale and blend various forms.

Soften bulkiness of structures by use of landscaping incorporated within form of building.

Create hills and berms to integrate overall land and building forms. Utilize existing rock outcroppings, slopes and ridges to define character of development and promote natural setting.



Provide underground, covered or screened parking.

**GUIDELINE NO. 2 Use design elements to express function, use and tropical setting.**

Provide variety in building envelope, wall plane and roof shape. Break structure into related components with distinctive appearance.

Link buildings and activities together through use of vestibules covered passages, terraces and arcades.

Promote indoor-outdoor relationships. Public spaces can be open to the outside to allow for natural breezes and the experience of the tropical environment.

Utilize recessed entries as shaded transition.

Promote natural ventilation of spaces. Orient for maximum wind exposure. Provide breezeways to capture cooling breezes.

Give consideration to treatment of entry, windows, cornices and other building elements that contribute to style.

Balance uses of concrete and masonry with natural materials. Naturally weathering materials provide a pleasant appearance with minimum maintenance. Temporary structures such as mobile homes and pre-engineered steel buildings are not desirable for the long term appearance of the area.

Utilize distinctive ground texture for visual character and continuity.

The nature, size, shape, style and lighting of all signs should be in harmony with the resort setting. Signs should be subordinate to buildings and fit within existing features of the structure.

**OBJECTIVE IV** Preserve existing mature trees and incorporate new landscaping to integrate development in natural setting.

**GUIDELINE NO. 1** Protect existing landscaping, especially mature trees and planting.

Existing trees and groupings established in their natural condition should be retained and protected during construction.

Selective thinning and removal are desirable to open specific vistas, to give shape and dimension to groupings, to create functional open space and to frame architectural elements.

Thin and shape existing vegetation for view, and to preserve mature trees.

Parking area layout should incorporate existing trees to the greatest extent possible.

Buildings should be located with respect to preserving large stands of mature trees.

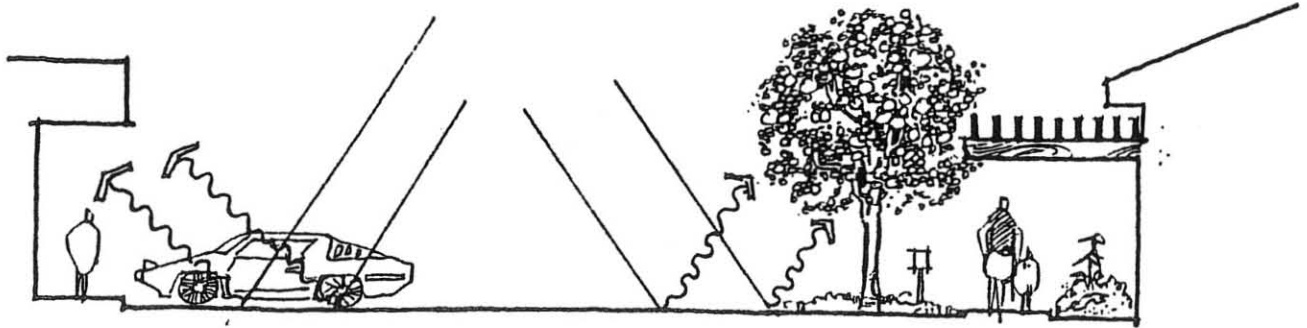
Maintain visual continuity of existing vegetation by replacing cleared areas with new landscaping.





**GUIDELINE NO. 2 Utilize landscaping as functional solutions.**

Utilize landscaping for traffic and circulation control, to screen objected views of service and mechanical areas and to provide privacy.



Buffer and shade parking areas to provide relief from sun glare and reduce surface temperature of paved areas. Large paved areas are hot and uninteresting. Landscaping cools and shades parking.

Utilize landscaping to enhance building line and form, to unfold an attractive vista or frame a view. Islands of landscaping with a glimpse of the ocean may be more effective than a sweeping panorama of horizon.

Utilize landscaping to shade, cool and direct breezes, to absorb unpleasant sounds, smells and dust and as erosion control on steep banks.

In some cases, planting itself becomes a focal point of development. Large planting groups are strong determinants of spatial form.

Provide other landscape elements including rock forms, water and sculpture.

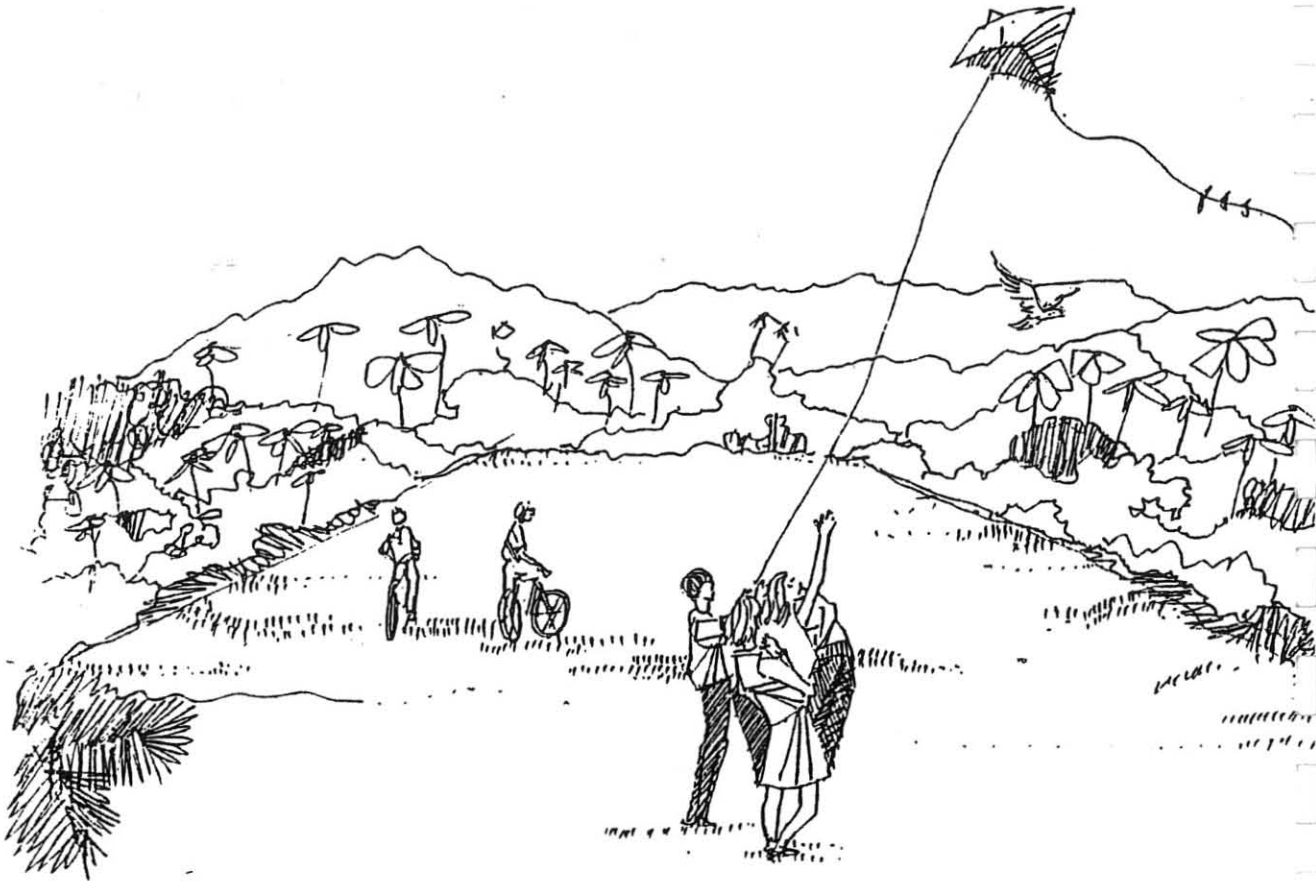
Landscape stormwater percolation areas to ensure attractive and maintained open space.

**GUIDELINE NO. 3 Utilize informal landscaping techniques to enhance the natural setting of the resort area.**

Irregularity and naturalness should be created by planting to blend with natural land forms.

Open space should be provided in key locations in order to maintain existing views.

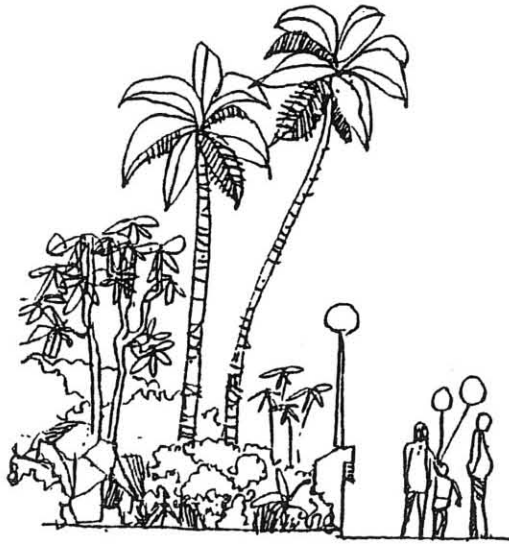
Utilize green areas for on-site disposal of stormwater runoff. Landscaped percolation trenches, covered ponding basins, recreation and open space areas and areas of natural vegetation will provide capacity for recharge of storm runoff. Covered ponding area can be used as recreation open space.



Adequate lighting should be provided at outdoor areas. Lighting should have a precisely defined purpose and not be disruptive to the adjacent surroundings or overall environment. Light poles should be no more than 15 feet in height, with underground electrical service.

Screen service and mechanical areas.

Plant in mass. Trees and major planting should be grouped into clusters forming simple landscaping elements.



Consider seasonal variation of color, loss of leaves and susceptibility to pest attack. Transient floral aspects, no matter how striking, should not be the sole basis of selection unless the specimen is also sound when not in flower.

Landscape lighting shall be low level. Underlighting of planting can serve also as walkway lighting. Limit spotting to specimen trees and dominant landscape forms.

**OBJECTIVE V** Scenic and natural features are key elements in the distinctive visual setting of the Tumon Bay resort area. Primary views and vistas are satisfying aesthetically, while functioning as physical orientation elements and image promotions for Guam as a tropical resort.

**GUIDELINE NO. 1** Protect and enhance view types which contribute to the scenic character of Tumon Bay. These include the following.

- Ocean-horizon panorama
- Enclosed shoreline, lagoon and reef
- Protruding shorelines
- Landmarks such as Puntan Dos Amantes & Satpon Point
- Distinctive land forms
- Encircling hillsides and ridges
- Recreational open space
- Conservation open space
- Historic and cultural features

Provide for variation in views from location to location in response to orientation, topography, land form, elevation, vegetation and adjacent development.

Evaluation of view development should recognize the distinctly different views of the area from outside and from entry points, as well as those views from within.

Provide for variety in views such as panoramic and continuous views (expansive, uninterrupted vistas, scenic in character), intermittent and focal views (channeled views of visual features, natural or man-made environmental) and shortened views (limited views of landscaping, improvements and pedestrians activity).

**GUIDELINE NO. 2** Preserve the visual character of the shoreline, and lagoon and beaches.

Promote the continued openness of the shoreline and the expansive views along the natural coastline.

Incorporate visually those activities which occur in relationship to these elements and which contribute to the tropical resort environment.

**GUIDELINE NO. 3** Resort development shall blend with the natural assets of the area.

Taller structures should be precisely located and oriented so as to capture views while not detracting from the quality of views for structures farther inland.

Development located adjacent to the shoreline should be low in height to blend with natural vegetation and to provide an acceptable transition in scale to the beach. Where hotel towers occur, they should be set back and oriented to provide a minimum interruption of the shoreline view.

Development adjacent to San Vitores Road and extending to the base of the hillside (predominantly tourist commercial or low scale residential) should relate to San Vitores Boulevard, neighboring development and site amenities.

Development occurring at the base and along the hillside may be high-rise construction to take advantage of view of the Bay over the low-rise residential and commercial development and provide for a positive visual silhouette against the backdrop of the hillside greenbelt.

**GUIDELINE NO. 4** Development shall be located in a manner to ensure that important vistas and view corridors are available to all properties.

Although building heights are not restricted in most cases, it is important that development maintain existings views and sightlines to enhance these views.

Vistas, view planes and view channels should be maintained in relationship to terrain and landmarks.

Views should be available to pedestrian and vehicular traffic at specific points along San Vitores Boulevard. These include views of the ocean and other natural features as well as those views of development itself. Conceived as a scenic boulevard, San Vitores will frame and strengthen these views while providing a pleasant foreground.

**OBJECTIVE VI** The Tumon Bay hillside and the Tumon Bay Areas of Natural Significance should be treated as areas of particular concern in the planning and design of development.

**GUIDELINE NO. 1** Intensity of development shall not disrupt topographic integrity of the hillside as a whole.

Slopes shall be developed in a manner to prevent erosion and siltation of adjacent properties. Provide for control and disposal of stormwater runoff.

Ensure continued stability of slopes. A Soil Investigation Report and earthwork recommendations shall be prepared where grading, cut or fill is proposed.

Slope protection shall be provided where erosion is possible. Landscaping and revegetation planting shall be included in initial project scope.

Development shall provide transition in grade to adjacent properties and shall not be disruptive to present or future use of these properties.

Roads, drives, walks and other travelways shall relate to overall hillside topography.

**GUIDELINE NO. 2** Sightlines and viewplanes shall be protected.

Development shall not penetrate sightlines from property located at top of the hill.

The view from adjacent properties shall not be blocked or restricted.

**GUIDELINE NO. 3** The existing natural character of the hillside shall be retained as a reference point, image and backdrop for the Tumon area.

The existing topographic and greenbelt character shall be preserved.

Transition in shape and scale shall promote integration of development in the overall hillside setting. Open space shall be provided between developments to minimize the overall silhouette of the development against hillside.

Removal of vegetation shall be minimized and revegetation shall be undertaken as a part of the development.

**GUIDELINE NO. 4** Intensity of development shall reflect the constraints and limitations of the hillside environment.

Minimum lot size for residential development shall be one-half acre.

Land coverage shall allow 50-percent of the lot to remain as open space. Open space shall be located to maximize the continued natural character of the hillside.

Building setbacks may be relaxed at the viewside and hillside portion of the site but shall be strictly enforced at the sideyards.

**GUIDELINE NO. 5** Areas of Natural Significance should be developed with special consideration to their inherent environmental character.

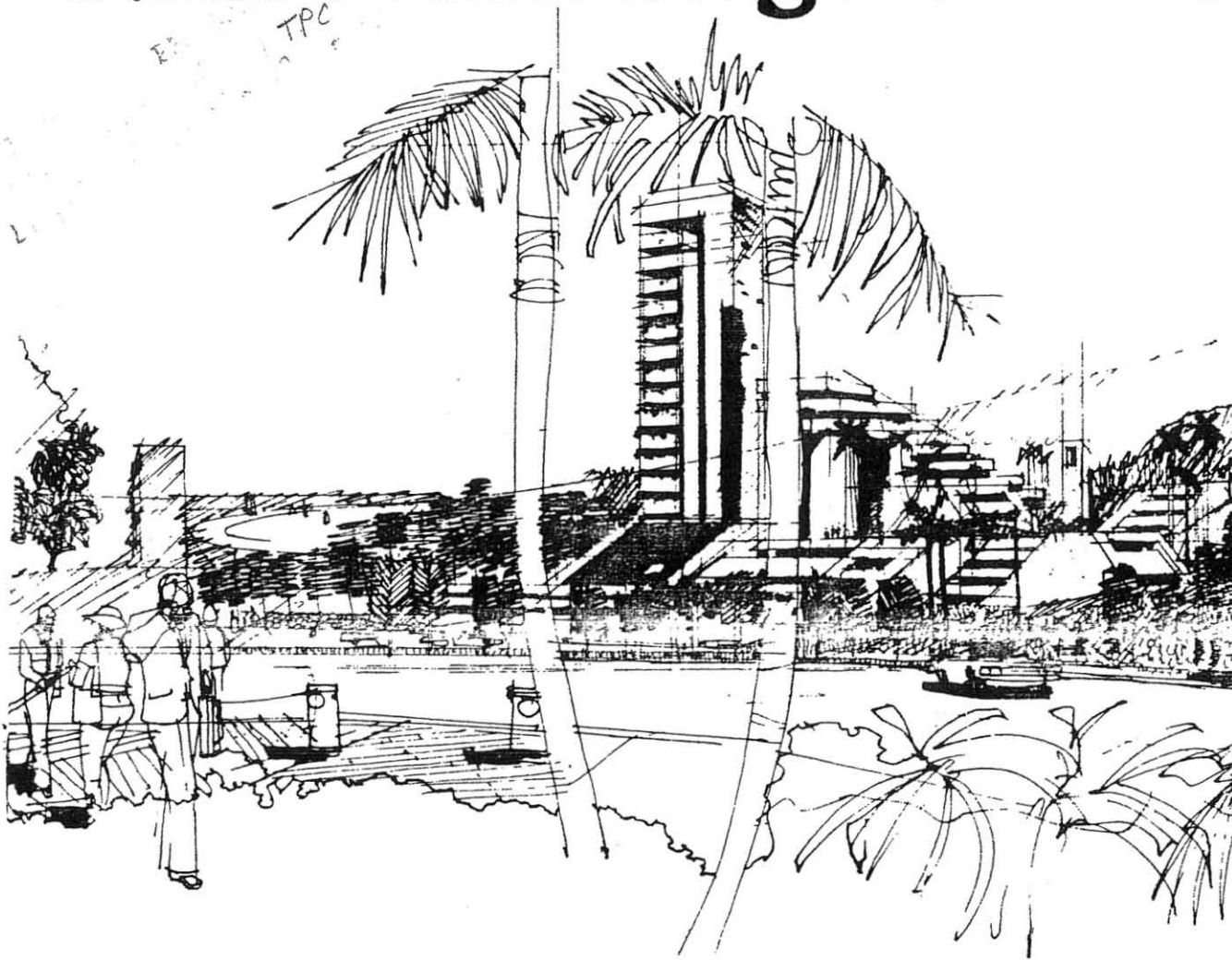
Where these areas provide a buffer between two significantly different land uses the development should provide for a gradual transition.

The existing vegetation should be preserved in mass to the greatest extent possible, even at the expense of setback, height and parking requirements of the land use zone.

Informal, low-density public use should be accommodated by projects in these areas wherever possible.

The Government of Guam should utilize every resource and tool at its disposal to cooperate with developers of these areas in order to preserve the existing environmental character to the maximum extent possible.

# Tumon Bay Master Plan Rules and Regulations



GOVERNMENT OF GUAM

Agaña, Guam

1985



TUMON BAY MASTER PLAN  
RULES AND REGULATIONS FOR DEVELOPMENT

CONTENTS

- A. Authority, Purposes and Intent
- B. Definition of Terms
- C. Procedures for Application and Submittal Requirements
- D. Mandatory Standards for Development

A. AUTHORITY, PURPOSES AND INTENT

These rules and regulations are to be promulgated in accordance with Public Law 13-40 as amended, by Public Law 15-132, by the Territorial Planning Commission under authority of Titles XIV and XVII of the Government Code of Guam and Public Law 14-41 as amended, by Public Law 14-72, and by Public Law 14-82.

The purposes of these rules and regulations are to establish procedural requirements for development within the Tumon Bay resort area, to establish mandatory standards for development, and to provide guidelines for the development of projects within Tumon Bay. This material has been prepared as an element of the Tumon Bay Master Plan under the authority of Public Law 15-132.

These Rules and Regulations apply to the Tumon Bay area rezoned "H" under the provisions of Public Law 14-41, as amended by Public Law 14-72 and 14-82 (Tumon) and/or subsequently rezoned to reflect the Tumon Bay Master Plan. These are final Rules and Regulations and supercede and replace the Interim Rules Regulations adopted on March 10, 1978.

B. DEFINITION OF TERMS

The following terminology is used in the regulations to define the standards and principles for development in Tumon Bay. The definitions provided here are intended to clarify and supplement those terms defined elsewhere in the Government Code.

|                    |                                                                                                                                                                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bonuses</b>     | Additional incentives given in return for public benefits and amenities provided beyond the scope of these rules and regulations.                                                                                                                       |
| <b>Buffer Zone</b> | Strip of land created to separate and protect one type of land use or activity from another. Usually this will entail the provision of open space, landscaping, fencing or other means as necessary to adequately insulate the incompatible activities. |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Building                | Permanent or temporary structure of vertical construction with open or enclosed sides and roof. This includes all covered structures but does not include open structures such as paved areas, decks and landscaping.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Building Envelope       | The net cubic space that remains for placing a structure on a site after open space, building setback and height standards are observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Building Height         | For purposes of these rules and regulations, the vertical distance from the lowest portion of the natural ground elevation and measured to the highest portion of the building roof.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Cluster Development     | Development that allows the reduction of setbacks below minimum requirements to group buildings, develop common open space, joint use parking, combined access and service, and other concepts which reduce the overall intensity of land utilization.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Community Facilities    | Public or privately owned facilities used by the public including streets, parks, beaches, playgrounds, churches and related uses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Conditional Use         | A use that may locate in a zone provided it will not be detrimental to the public health, morals and welfare and will not impair the integrity and character of the zone.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Conservation Easement   | The purchase of specific rights from an owner which limit the environmental uses to which the owner may put his land in the future.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Dwelling, Single family | A detached building containing only one dwelling unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Dwelling, Multi-family  | A detached building containing two or more dwelling units.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Environmental Impact    | The assessment of a proposed development or activity to determine if it will have significant environmental effect on the natural and manmade environment. Significant environmental effects are generally associated with air and water quality, wildlife habitat, food chains, neighborhood and community structure and quality of life, noise, endangered plant and animal species, appearance and surrounding of scenic, historical, cultural, archaeological, or recreational sites, and where action will induce secondary effects on others from the direct beneficiaries or targets of an action such as traffic congestion, overload of infrastructure, flooding, social, cultural and moral side effects. |

|                   |                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exception         | Provision of an exemption or variance from compliance with the terms and conditions of the regulations. Granted where there are practical difficulties in meeting existing requirements if the deviation or exception will have a positive impact on adjacent properties.                                                                       |
| Guidelines        | Policy, principles and criteria requiring developments to be suitable, harmonious and in keeping with the general appearance, resort character and environmental preservation of the area and its surroundings.                                                                                                                                 |
| Landscaping       | An area covered with soft live flora such as lawn, ground cover, trees, shrubs or any other materials which present a natural and green appearance. This includes natural vegetation left undisturbed.                                                                                                                                          |
| Lot               | Parcel of land occupied or to be occupied by a use, activity or buildings together with all yards, open space, parking areas and other areas as required.                                                                                                                                                                                       |
| Nonconforming Use | A structure or use that is not permitted by the rules and regulations currently in effect. If established prior to the promulgation of the rules and regulations, it is classified as legal nonconforming use and may continue although it may not be extended, enlarged, converted to new nonconforming use or rebuilt as a nonconforming use. |
| Open Space        | The portions of a parcel unoccupied or undisturbed by buildings, roads, parking or ancillary structures from the ground upward. Sidewalks, decks and plazas are considered open space.                                                                                                                                                          |
| Setback Line      | The requirement that a building be setback a certain distance from the mean high watermark, street or lot line either on the ground level or at a prescribed height.                                                                                                                                                                            |
| Preliminary Plan  | A plan based on limited study and analysis. Its function is to present and examine preliminary ideas and to set a direction for subsequent stages of the work. Its purpose is to define certain key relationships, display the scope and nature of the development and establish the criteria by which the project will be completed.           |
| Site Coverage     | The total square footage of a lot covered by a building measured on a horizontal plane at mean grade level, exclusive of uncovered decks, sidewalks steps, parking or access roads.                                                                                                                                                             |
| Standards         | Mandatory or compulsory requirements establishing specific criteria to be met by a project.                                                                                                                                                                                                                                                     |
| Story             | That portion of a building between the surface of any floor and the surface of any floor or roof next above it.                                                                                                                                                                                                                                 |

|      |                                                                                                    |
|------|----------------------------------------------------------------------------------------------------|
| Use  | The purpose of which land or a building is arranged, designed, occupied or intended for.           |
| Yard | The space on a property not built upon and situated between the building and its nearest lot line. |

#### C. PROCEDURES FOR APPLICATION AND SUBMITTAL REQUIREMENTS

Application for conditional uses to be located within the Tumon Bay project area shall be submitted to and approved by the Territorial Planning Commission prior to the start of clearing, grading or construction of any project or portion of project. Applicant must complete the Tumon Bay Development Application Form and provide all supporting information required by this section. Where necessary information is not submitted or not prepared in sufficient detail for the thorough review by the Commission and its advisory committees, the applicant shall be required to provide such supporting information prior to review of the application by the Commission. The Commission may require the submission of detailed construction drawings as work is undertaken to permit the analysis of construction conformance to the law, rules and regulations and conditions imposed by the Commission. The application should be submitted by the landowner or other entity having a legally recognized interest in the land.

##### Procedures for Application Submittal

Approximately one month will be required for the complete review of each application provided complete and accurate information has been provided. Each application and the supporting material shall be first reviewed by the Environmental Review Committee (ERC) for adherence to the Mandatory Standards and Guidelines for development in Tumon Bay. The ERC will review each application in detail and will consult to the extent necessary with the applicant or his representative. If warranted, the applicant may be requested to revise his application to meet the criteria of the Mandatory Standards and Guidelines.

Following review by the ERC, the application will be reviewed by the Subdivision and Development Review Committee (SDRC) as a technical representation of all pertinent Government of Guam agencies. SDRC will hold a public meeting on each application at which time the applicant or his representative should attend.

Review comments and recommendations by the ERC and SDRC shall then be forwarded to the Territorial Planning Commission for their final review. At a public meeting the Commission shall either approve, approve with conditions, or disapprove in whole or in part that application and its supporting information. The Commission may stipulate that the supporting material be revised to conform to the conditions required by the Commission, such revision to be submitted to the Commission or, as designated, the Chief Planner prior to final approval by the Commission. No clearing, grading or demolition, sign or construction permit shall be issued by the Building Official until such time as this revised material is submitted to the Commission and final approval granted.

Application for a construction permit of any type shall include a complete copy of the approved application, supporting material, Commission approval and conditions.

Any proposed use or building, or revision which has not been included in the approved application, shall be approved by the Commission before undertaking any such work and shall be reflected in a revised building permit application.

A performance bond will be required for all development undertaken pursuant to an approved application. The amount of the bond shall be One Hundred and Ten Percent (110%) of the estimated infrastructure, storm drainage and landscaping costs for the project, and shall not be less than Four Thousand Dollars (\$4,000.00). The entire bond or undertaking of any portion thereof shall be forfeited as determined by the Commission for failure to comply with the conditions of the application and approvals. This bond must be presented to the Building Official prior to issuance of a building permit for any portion of the project. The entire bond, or any portion thereof, shall be forfeited as is required to complete the site preparation, infrastructure, stormwater disposal, erosion control and landscaping portions of the project should these not be completed by the applicant. The Performance Bond shall not be released in any form until the Commission has accepted the development or improvements as meeting the scope of its approval and conditions.

The Commission shall set a maximum time period within which all of the improvements authorized in the application approval shall be completed. The time period shall be based on the size, character and complexity of the authorized improvements. The Commission may, for good cause shown, grant any extension of time.

Upon completion of any portion of the project in accordance with the approved application, the Building Official shall certify to the Commission that the project has been completed in accordance with the approved application. Occupancy permits shall not be granted by the Building Official until such time that the Chief Planner has the opportunity to visit the project to determine that work has been completed in accordance with the approved application.

Requirements for the preparation of supporting information and posting of performance bonds as outlined in this section shall not apply to construction of individual single family dwellings other than subdivisions of three or more units.

#### **Submittal Requirements**

For submittal requirements, the applicant shall complete in its entirety the Tumon Bay Development Application prior to consideration by the Commission. Supporting information which must accompany the application includes the following material:

1. Vicinity Map indicating location of development in relation to its surrounding environment.
  - a. Identification and location of adjacent structures and activities within 500 feet of the proposed development.
  - b. Location of road rights-of-way, easements and other travel ways.
  - c. Location and size of existing utilities, watercourses, and drainage facilities located on or adjacent to and serving the proposed development.

- d. North arrow and graphic scale.
2. Preliminary Site Plan establishing the overall scope of the development and its relationship to existing conditions. The plan shall indicate the extent of phasing of future increments which may be undertaken under a separate application.
- a. Length and bearing of exterior property boundaries of the development. Accurate location of the mean high water line and the Territorial Seashore Protection beach setback where applicable.
  - b. Existing and proposed topography with contour intervals of 2 feet. Where slopes exceed 15 percent, 5-foot contour intervals may be used.
  - c. Accurate placement and outline of existing structures, rock outcroppings and other features located on the site. Location and size of all existing trees with a trunk diameter greater than 6 inches and an indication of where trees will be removed.
  - d. Approximate layout and dimension of each proposed structure, facility and use to be located within the development. Dimension of setbacks to vertical structures. Location of free-standing signs.
  - e. Indication of width of pavement for all improved roadways including streets and driveways to be located within or adjacent to the development. Identification of improvements to be made within existing rights-of-way, including sidewalks and landscaping.
  - f. Proposed parking layout indicating the required automobile and bus parking spaces, proposed service areas and landscaping elements.
  - g. Indication of the size and layout of natural and improved open space. Identification of improvements for public use including beach access routes.
  - h. Proposed methods and approximate location of facilities for on-site disposal of stormwater runoff.
  - i. Landscaping and revegetation plan indicating trees to be saved and scope of new landscaping to be provided. This plan is understood to be a tentative plan. Final plans will be submitted for review and approval of the Chief Planner prior to issuance of a building permit.
  - j. North arrow and graphic scale.
3. Preliminary design of all buildings included within the development to fully explain the visual appearance of the development and its relationship to the adjacent environment.
- a. Elevation or perspective sketch of the main view of each structure. At a minimum, this must include the view from San Vitores Boulevard or other main vehicular and pedestrian access to the site. Where the development fronts on the Territorial Seashore Protection Reservation, a view from the beach side of the development is required.

- b. Section view through the site and major structures indicating existing groundline, proposed finish grades, height and setback of structures. Setback-height curves are provided in these Standards and should be used to indicate the placement of the building within the setback limitations.
- c. Graphic scale.



#### D. MANDATORY STANDARDS

The following regulations constitute compulsory regulations for all projects and developments to be located within Tumon Bay. Any deviation from these stipulations must be stated specifically in the application form and must be acknowledged in approval of all or part of an application by the Commission. In all cases, the applicant has the burden of proving that any deviation will not have an undue and adverse impact on the Tumon Bay area. The Commission, in determining the reasonableness of deviations, recognizes the public benefit which will incur from additional private and public amenities provided by the development.

##### 1. OPEN SPACE RATIO

Land use intensity is a method for relating site coverage by buildings to related needs for open space and parking/access/service area. Site coverage is intended to be the "footprint" of buildings on the site and does not consider the floor area of upper floors or the overall density of the development. Where here the first floor is elevated above the ground level, its ground coverage ratio shall be based on the proposed use for the area below the structure and the amount of open space which will be provided.

For purposes of this ratio, open space is considered to be plazas, terraces, decks and other outdoor areas which are not covered or walled, landscaped areas, recreation and open space, improved or unimproved natural areas, covered stormwater disposal areas, and pedestrian walkways. The applicant must provide for and establish adequate procedures to insure the continuity, conservation and maintenance of open space. Subsequent modification to the quality or quantity of open space must be approved by the Commission.

Parking for purposes of this ratio is considered to be vehicle parking areas including access roads, streets and drives. Loading and service areas are considered to be part of the parking area.

The figure below indicates the maximum percent of site coverage for structures and parking roads and services, the minimum allowable site coverage for open space.

|                                                 | STRUCTURES | PARKING, ROADS<br>& SERVICE | OPEN SPACE |
|-------------------------------------------------|------------|-----------------------------|------------|
| Resort                                          | 20%        | 35%                         | 45%        |
| Tourist-<br>Commerical                          | 25%        | 45%                         | 30%        |
| Multi-Family<br>Residential                     | 20%        | 45%                         | 35%        |
| Single-Family<br>Residential                    | 20%        | 10%                         | 70%        |
| Hillsides & Areas<br>of Natural<br>Significance | 15%        | 25%                         | 60%        |

## II. SETBACK-HEIGHT STANDARDS

The major considerations when evaluating setback-height standards are light, air, open space, compatibility with adjacent uses, preservation of scenic views and the overall aesthetics and character of the area. For Tourist/Commercial and Single-family Residential zones, the height of vertical construction will be strictly enforced at two (2) stories, not to exceed 30-feet. This standard coincides with the current zoning law. For Resort and Multi-family Residential a height limitation is not specified. Rather, the setback controls establish the placement and space between buildings, with the height to seek its most efficient relationship.

It is generally advantageous to site buildings as objects with adequate open space surrounding each structure to allow for the continued enjoyment of views and vistas by all properties. Although a ceiling on height is not prescribed, previous policies have delineated the crest of the hillside adjacent to Marine Drive as an overall ceiling, i. e., that no building should project above the crest.

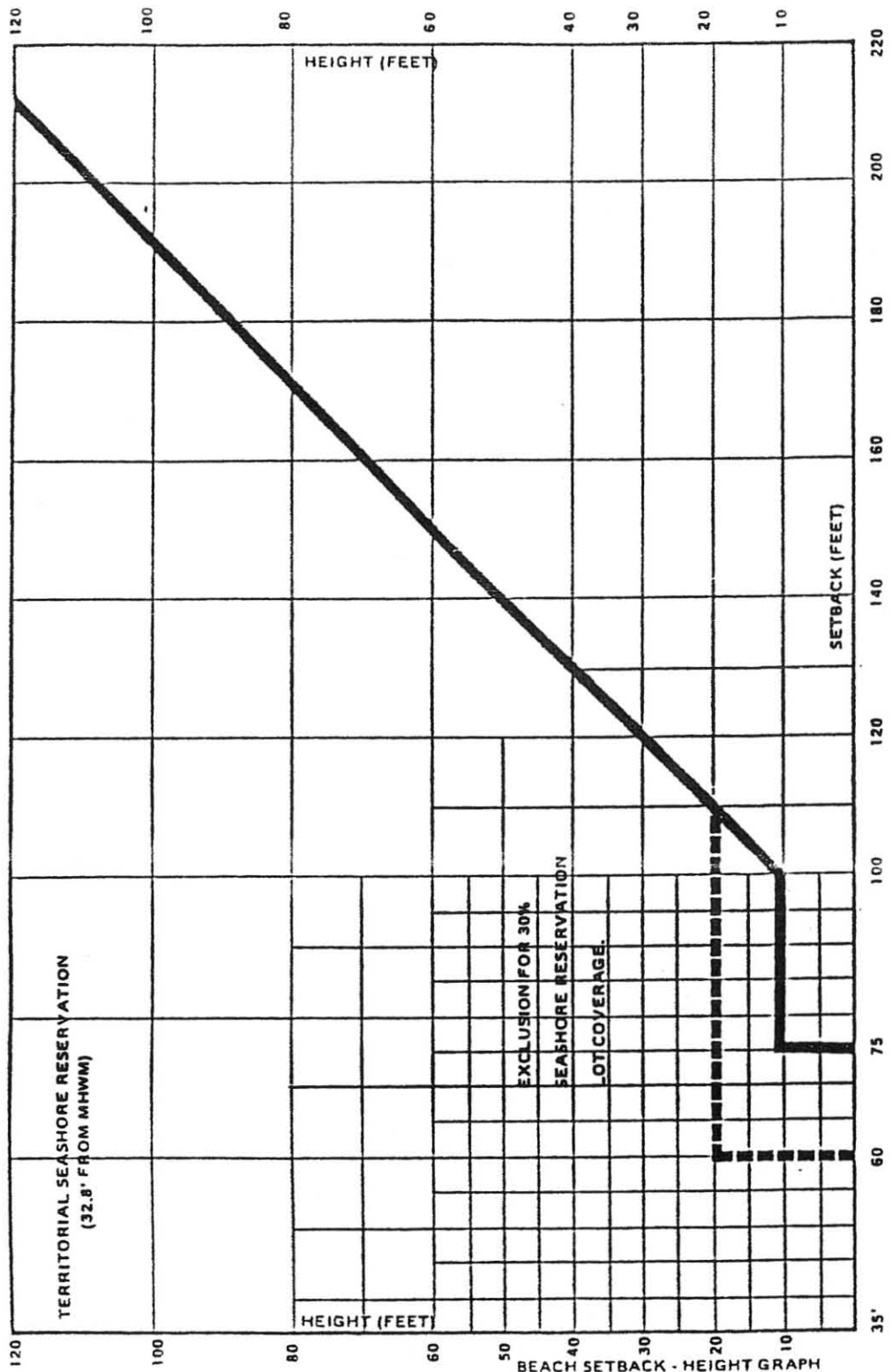
Height-setback graphs are provided for each land use. These curves reflect the relationship between height and the space between buildings. Additionally it is recommended that taller buildings be clustered in a manner to minimize the impact of each individual tower. Certain concessions in the setback-height standards can be made by the Commission where a desirable concept of clustering is proposed. The intention of clustering and spacing of buildings in the Resort zone is especially relevant to the image of the area and the maintenance of views from residential properties inland and against the encircling hillside. It is not desirable to create a wall of buildings which will effectively cut-off the view of the shoreline and ocean.

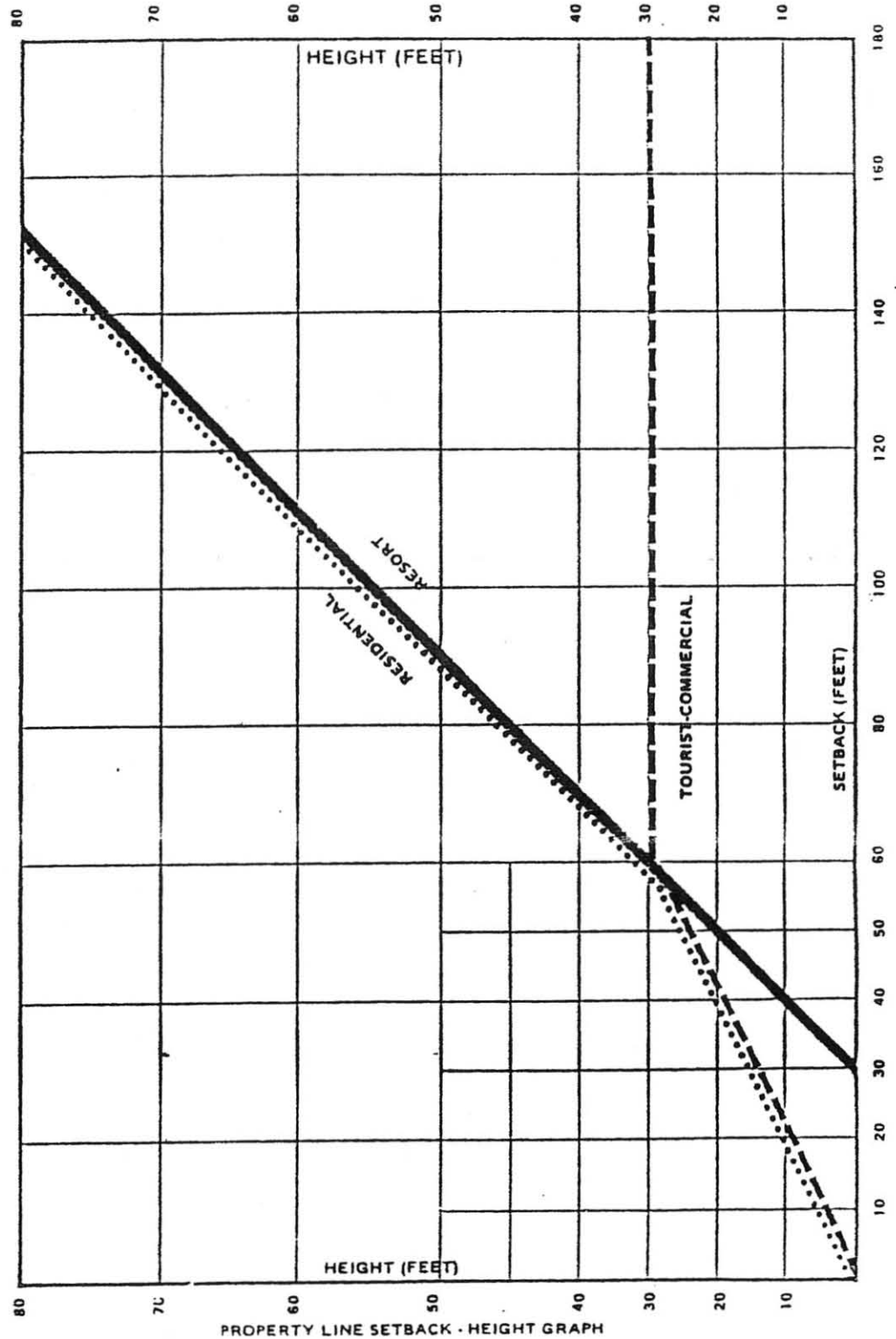
Setback-height relationships for development occurring adjacent to the hillside shall be determined by the Commission based on topographic and view considerations.

Development within or adjacent to the Territorial Seashore Protection Reserve must meet the requirements of the Seashore Protection Act, Title XVI, and Zoning Law, Title XVIII, as further defined herein.

Setbacks shall be provided from the mean high water level pursuant to the Seashore Protection Act as follows:

- |                                            |                                                                                                                                                                                                                                                                                     |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Setback (a) 0-10 meters -<br>- (32.8 feet) | Beach reservation zone for use as public access and recreation. All development as defined in Title XIV, Section 13412(c), as amended by P. L. 13-154, must receive approval of the Territorial Seashore Protection Commission and other cognizant government and Federal agencies. |
| Setback (b) 32.8 - 75 feet -               | No vertical construction which will obstruct the visual openness and continuity of the beach area is permitted. Open space, rest and recreation areas, swimming pools, terraces landscaping and related outdoor improvements are allowed. Parking areas are not permitted.          |





PROPERTY LINE SETBACK - HEIGHT GRAPH

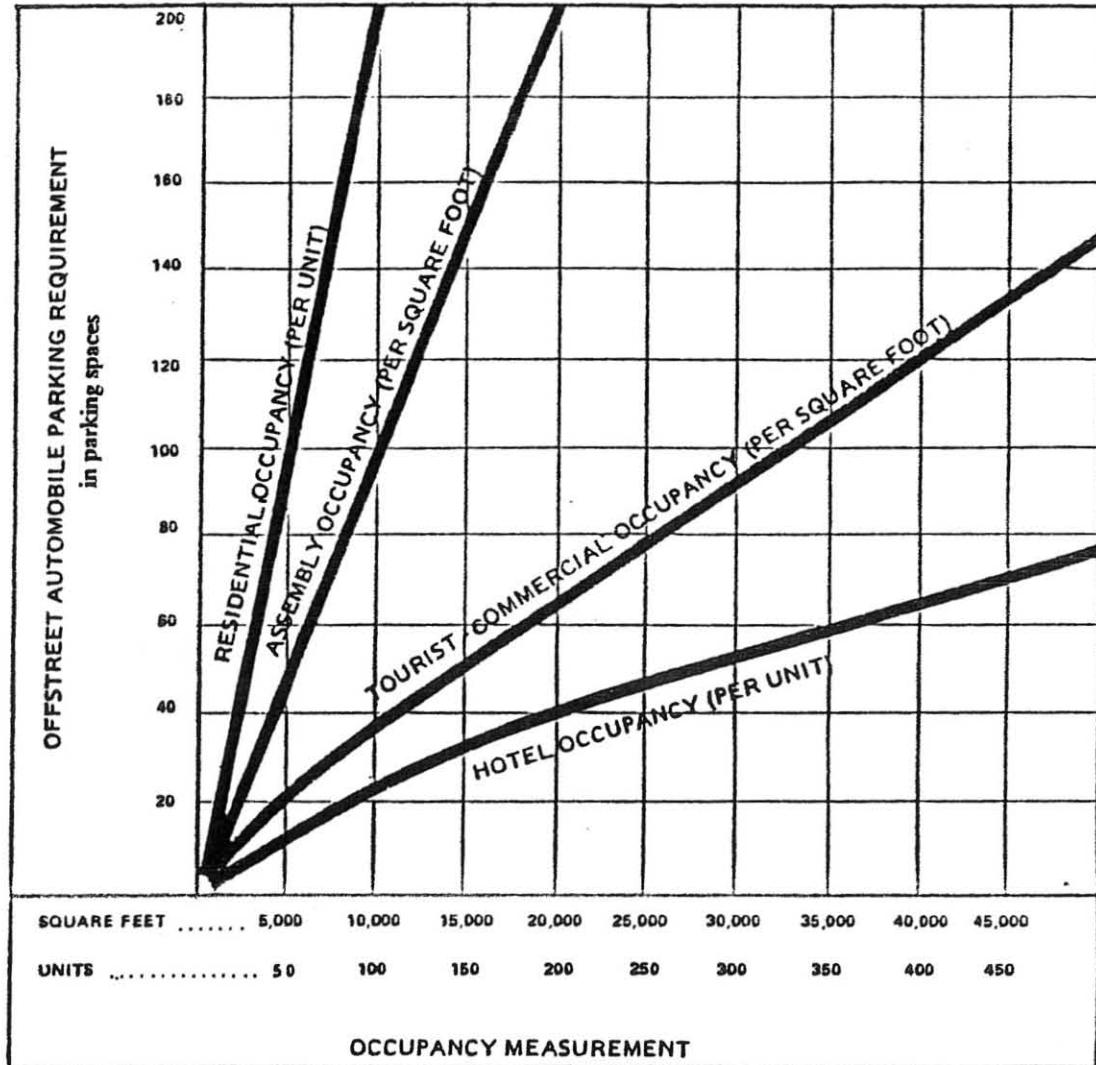
- Setback (c) 75-100 feet - Single-story structures, covered porches, trellises and similar improvements not to exceed 12-feet in height measured from the natural grade line. Parking is permitted.
- Setback (d) 100-feet back - Building height based on Beach Setback-Height graph.
- For those lots where thirty percent (30%) or more of the land area of such lot is affected by the mandatory setback, the building restriction is modified as follows:
- Setback (a) 0-20 feet - Beach recreation zone for use as public access and recreation.
- Setback (b) 20-60 feet - Shall be open space with no vertical construction or parking permitted.
- Setback (c) 60-100 feet - Single and two-story structures only with the total height not to exceed 20 feet in height.
- Setback (d) 100 feet back - Building height based on Beach Setback-Height graph.
- In the areas where a cliff or a bluff higher than 25-feet occurs adjacent to the Seashore, the Commission shall evaluate the setback restrictions on a project-by-project basis.

### III. PARKING REGULATIONS

Automobile parking as required by this section, or as determined by the Commission, shall be provided prior to issuance of an occupancy permit for use of any development or activity including enlargement and extension of existing facilities. Required parking shall be maintained throughout the life of the project, and any modification in the provision of the required parking must be approved by the Commission.

Off-street parking space shall be provided as delineated in the "Offstreet Automobile Parking/Requirement" graph.

This graph represents the total automobile parking anticipated and includes the requirement for employee parking. The total parking required for any application shall include the separate requirements for hotel/resort, assembly function, tourist-commercial and residential uses within the project. The total parking required shall be the total of all occupancy requirements. The Commission, should they feel it is warranted, may increase or decrease this parking requirement to provide for exceptional circumstances.



**NOTE:**

- 1) The total offstreet parking to be provided is based on the sum total of the individual requirements for each occupancy to be included in the project.
- 2) Parking requirements for recreational, amusement and open space activities will be determined by the Commission.
- 3) Assembly occupancy includes Restaurant, Dining, Banquet, Drinking, Convention.

For usages and activities with a large ratio of building area to user or employee population, the total off-street parking and service requirement shall be established by the Commission based on the projected use and vehicle load forecast. This will include those projects utilizing extensive open space or outdoor area, amusement and recreational oriented projects.

In addition to the parking as required by the Graph, the following requirements and provisions apply to off-street parking provided in conjunction with each development:

1. Bus parking for Resort Zone - one (1) bus parking space for each twenty (20) automobile parking spaces.
2. Joint-use parking available for public usage - Ten percent (10%) of the total parking allowance for all but residential shall be designated as joint-use parking and shall be available at all times for use by the public for functions unrelated to the development. Such parking shall be located in an area easily accessible to the beach and shoreline, public walkway/bikeway and beach access routes.
3. Residential parking - for projects where on-street parking is available at a curb adjacent to the project, this parking will serve to satisfy a portion of the over-all requirement, but not to exceed fifteen percent (15%) of the total requirement.
4. Loading Space - off-street loading spaces shall be provided, located and scaled to meet the anticipated needs of the development. In general, off-street service areas shall be located in such a manner that there will be minimum interference with off-street parking, access and vehicular movement.

#### IV. SIGN REGULATIONS

The sign regulations as stated herein apply to all signs, whether permanent or temporary in nature, which are erected or intended to be erected in Tumon Bay. Signs to be erected in Tumon Bay must meet the criteria herein as well as that of the Government Code of Guam Chapter IX of Title XVIII and the Building Law.

##### Approvals

Erection of a sign or alteration of an existing sign requires approval of the Territorial Planning Commission. Preliminary sign plans will be approved by the Commission at the time of the Tumon Bay Development Application. Final approval must be obtained from Chief Planner prior to construction. Final plans shall include construction plans for the proposed sign and method of erection. Drawings shall show all exterior views including materials, lettering, colors, lighting, size and height.

Upon approval by the Commission and Chief Planner for the sign or signs requested, and before the start of any sign construction, applicant shall submit plans to the Building Official for issuance of a sign permit.



### Sign Area Calculation

The area of a sign shall include the entire area within a single, continuous perimeter enclosing the extreme limits of writing, graphic symbol, logo or art object, together with any structural frame or other material or color forming an integral part of the sign from the background against which it is placed. For free-standing signs (monument signs), the area of the sign permitted will be that allowable for each face of the sign. The supports or uprights on which the sign is placed are considered as part of the overall structure and area of the sign.

Signs shall be of permanent construction of a design, material, color, size and shape which is tasteful and relates to the character of the development and surrounding area. Moving, flashing and audible signs are not permitted. Luminous paints and reflective materials are not permitted. Plastic or acrylic signs are not permitted. Signs shall not be internally lighted. Indirect lighting of signs is encouraged.

### Sign Types

1. **Free-Standing Sign** - Self-supported and not attached to building or structure. Recommended where structures are set back from the street and for large complexes with several structures and activities. Includes portable and monument signs. Billboards and advertising signs not permitted in any form.
  - a. Not permitted in the public right-of-way or any easement.
  - b. Shall not disrupt pedestrian or vehicular traffic, their view or sight-lines.
  - c. Top edge of sign shall not project over 10 feet above the ground line. Area limitations shall be as specified for Sign Purpose.
  - d. Internally lighted signs are not permitted. Spot lighting and landscape lighting are encouraged.
  - e. Landscaping to complement the sign is mandatory.
  - f. Maximum of one sign allowed per development.
2. **Building Sign** - Mounted on a part of the exterior wall of a building or structure. This includes signs affixed to glass, trellises and other non-structural parts of the building. Roof mounted signs are not permitted.
  - a. Flush mounted signs or individual letters applied to the building are encouraged. Projecting or hanging signs and signs mounted on eaves and canopy fascia are discouraged.
  - b. Signs shall not project above building or wall on which mounted.
  - c. Interior signs attached to or within one foot of an exterior window and facing the public view are considered building signs.

## Sign Purposes

### 1. Identification Sign

#### a. Resort or commercial cluster sign.

- o name of complex only (individual business listing not allowed).
- o one ground sign or building sign permitted.
- o 24 square feet per sign face maximum.

#### b. Business Sign

- o information limited to name of business, building address, product or nature of business and graphic symbol, logo or art object related to business trademark.
- o one ground sign per lot or one building sign per building permitted.
- o total size of all signs not to exceed 3% of total building frontal area or 32 square feet, whichever is least.

#### c. Residential Sign

- o single family residence, one sign of 3 square feet maximum area, building mounted.
- o multi-family, one sign of 32 square feet to identify building and/or address, ground or building mounted.

#### d. Beach, Park or Recreational Area Sign

- o one sign per primary entrance permitted, ground sign not to exceed 24 square feet per sign face.
- o rules and regulations for use of recreation areas are excluded for these standards, subject to approval of the Department of Parks and Recreation.

### 2. Orientation Signs

#### a. Directional signs

- o to define entrance and exits, service and parking areas for large complexes.
- o ground signs permitted, maximum area per ground mounted sign to be 6 square feet.
- o number of signs to be determined based on need.

#### b. Directory sign

- o identification location of building and commercial activities in a large complex.
- o ground sign permitted.
- o to be located at the focal point for arriving traffic, but not to be visible from the street or serve as an identification sign.

- o maximum area to be 24 square feet.
    - o one allowed.
  - c. Traffic control signs and street signs are excluded subject to approval of Department of Public Works Highway Division.
  - d. Historic and interpretative signs are excluded subject to approval of the Guam Historic Preservation Officer.
- 9. Temporary Signs
  - a. Construction signs
    - o allowable only during the period of construction or renovation.
    - o renewal for 6 month periods based on need.
    - o information limited to the project/building name, tenant, owner/developer name, financier, architect/engineer and contractor.
    - o one ground sign or building sign permitted, maximum 24 square feet.
  - b. Announcement sign
    - o non-permanent building or ground sign to announce one-time activities and events.
    - o maximum area 8 square feet.
    - o sign permitted for a maximum period of one week.
  - c. Interim sign
    - o may be erected prior to completion of a permanent sign for a designated period not to exceed 60 days.
    - o shall comply with criteria for type, purpose and location stated herein.

**TUMON BAY DEVELOPMENT APPLICATION**

TUMON BAY DEVELOPMENT APPLICATION  
TERRITORIAL PLANNING COMMISSION  
AGANA, GUAM

To: Executive Secretary, TPC  
c/o Planning Division  
Department of Land Management  
Government of Guam

The undersigned, owner/lessor, of the following legally described property hereby requests your consideration for a use approval.

1. a. Name of Applicant: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
b. Developer of Project: \_\_\_\_\_  
c. Person or firm preparing design: \_\_\_\_\_
2. Location Description and Ownership:
  - a. Lot Number: \_\_\_\_\_
  - b. Registered Owner: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_
  - c. Certificate of Title No: \_\_\_\_\_ Recorded Document No: \_\_\_\_\_
  - d. Lot Area: \_\_\_\_\_ Square Meters \_\_\_\_\_ Square Feet
3. Land Use and Proposed Use:
  - a. Tumon Bay Master Plan Zone:  
\_\_\_\_\_  
\_\_\_\_\_
  - b. Existing Use:  
\_\_\_\_\_  
\_\_\_\_\_



5. a. Describe compatibility with resort image and relationship to surrounding land uses, natural features, shorelines and maintenance of views:

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- b. Improvements to government land or community facilities planned:

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- c. Accessibility to community assets including beach, recreation and open space:

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- d. Extent of preservation of existing vegetation and scope of new landscaping to be provided:

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- e. Impact on historical, archaeological or unique ecological sites and methods for mitigation:

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6. Approximate date for start of construction: \_\_\_\_\_

Completion of construction: \_\_\_\_\_

Incremental schedule for construction by phase or unit:

\_\_\_\_\_

\_\_\_\_\_

7. Supporting information: Applicant shall submit twenty (20) copies of each item listed in the Submittal Requirements section of the Rules and Regulations. Additional information may be requested by the Chief Planner to fully describe the application.

8. Should this application be approved, it is understood that only that particular use described in this application and conditions set forth by the Territorial Planning Commission shall be authorized. All approvals of the Commission, with conditions, must be completed prior to issuance of an occupancy permit.

9. The applicant certifies that no less than three percent (3%) of the total construction cost for development and improvements will be expended on landscaping of the project. Allowable costs under this requirement include the costs for purchase of landscaping and vegetation, the labor involved in its planting, relocation, trimming and preservation of existing trees. Costs for covered ponding basins, grading and related improvements other than direct landscaping are not to be included. Applicant must submit final landscaping plans for approval of Chief Planner prior to start of construction on any part of the project.

I hereby certify that all information contained in this application and its supplements are true and correct. I also understand that any misrepresentation in this application will void the entire submission.

Date: \_\_\_\_\_

\_\_\_\_\_  
Applicant(s) Owner or Lessor

\_\_\_\_\_  
Representative

