

Territory of Guam
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OFFICE OF THE GOVERNOR
HESNAN MAGA LAHI
AGANA, GUAM 96910 USA

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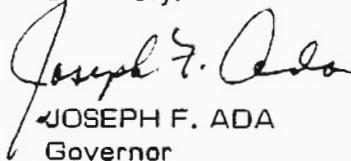
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The Honorable Joe T. San Agustin
Speaker, Twentieth Guam Legislature
Post Office Box CB-1
Agana, Guam 96910

Dear Mr. Speaker:

Transmitted herewith is Bill No. 999, which I have signed into law this date as
Public Law No. 20-163.

Sincerely,


JOSEPH F. ADA
Governor

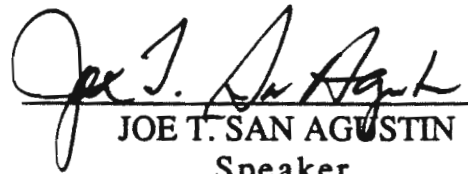
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TWENTIETH GUAM LEGISLATURE
1990 (SECOND) Regular Session

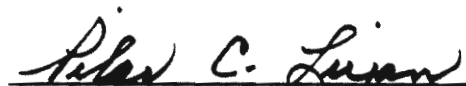
CERTIFICATION OF PASSAGE OF AN ACT TO THE GOVERNOR

This is to certify that Substitute Bill No. 999 (LS), "AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO STUDY THE ESTABLISHMENT OF A TERRITORIAL AQUARIUM AND TO APPROPRIATE FIFTY THOUSAND DOLLARS THERETO," was on the 1st day of May, 1990, duly and regularly passed.




JOE T. SAN AGUSTIN
Speaker

Attested:



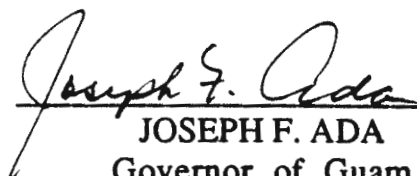
PILAR C. LUJAN
Senator and Legislative Secretary

This Act was received by the Governor this 7th day of May,
1990, at 4:39 o'clock P.m.



Assistant Staff Officer
Governor's Office

APPROVED:



JOSEPH F. ADA
Governor of Guam

Date: MAY 10 1990

Public Law No. 20-163

TWENTIETH GUAM LEGISLATURE
1989 (FIRST) Regular Session

Bill No. 999 (LS)

As substituted by the Committees
on Tourism & Transportation and
General Governmental Operations
and as further substituted by the
Committee on Rules

Introduced by:

J. P. Aguon
C. T. C. Gutierrez
~~F. J. A. Quitugua~~
H. D. Dierking
T. V. C. Tanaka
A. R. Unpingco
M. D. A. Manibusan
M. C. Ruth
J. T. San Agustin
E. P. Arriola
M. Z. Bordallo
P. C. Lujan
G. Mailloux
T. S. Nelson
D. Parkinson
E. D. Reyes
F. R. Santos
J. G. Bamba
D. F. Brooks
E. R. Duenas
E. M. Espaldon

AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO STUDY
THE ESTABLISHMENT OF A TERRITORIAL AQUARIUM
AND TO APPROPRIATE FIFTY THOUSAND DOLLARS
THERE TO.

1 LEGISLATIVE FINDINGS. The Legislature finds that the territory of
2 Guam, surrounded as it is by the Pacific Ocean and Philippine Sea, has not

1 adequately explored the opportunities that may be available to present in an
2 attractive, accessible way, the rich varieties of aquatic plant and animal life to
3 residents and visitors by means of an aquarium.

4 The Legislature further finds that an aquarium which attractively
5 displays such varieties of aquatic plant and animal life can perform the
6 multiple roles of a tourist attraction, a teaching tool, a research facility, and a
7 location where residents can go for entertainment and information.

8 The Legislature further finds that the rich cultural heritage of the
9 Chamorro people has many links with the ocean and that those links can be
10 more properly described, displayed and preserved through such a facility.

11 **LEGISLATIVE INTENT.** The Legislature therefore intends that a Council
12 should be created to plan for the establishment of an aquarium in Guam. The
13 Council should be given the task of investigating the various ways and means
14 necessary to create a facility that will serve as such a tourist attraction, teach
15 tool, research facility, and information, entertainment and cultural
16 preservation site. The 1980 study commissioned by Public Law No. 15-29
17 should be utilized as a starting point for preparation of recommendations.

18 The Legislature further intends that the Council should investigate all
19 possibilities of financing and managing such a project so that the best possible
20 facility can be built for the people of Guam and report its findings to the
21 Legislature so that an aquarium for the people of Guam can become a reality.

22 **BE IT ENACTED BY THE PEOPLE OF THE TERRITORY OF GUAM:**

23 Section 1. There is hereby created within the University of Guam
24 Marine Laboratory (the "Marine Lab") the Territorial Aquarium Advisory
25 Council ("TAAC"), which shall make preliminary plans for the establishment of
26 an aquarium within Guam. TAAC shall seek information and prepare
27 recommendations regarding possible funding sources, available sites,
28 proposed structure designs, possible management schemes and any other
29 pertinent data and information TAAC deems necessary for the preparation of
30 said recommendations.

31 Section 2. The director of the Marine Lab shall chair TAAC which shall
32 be comprised of the chief executive officers of the following government
33 agencies:

34 (a) Guam Visitors Bureau;

- 1 (b) Department of Parks and Recreation;
- 2 (c) Department of Commerce;
- 3 (d) Department of Land Management;
- 4 (e) Department of Public Works;
- 5 (f) Division of Aquatic & Wildlife Resources, Department of
- 6 Agriculture;
- 7 (g) Guam Economic Development Authority;
- 8 (h) Bureau of Planning;
- 9 (i) Guam Community College; and
- 10 (j) Guam Environmental Protection Agency.

11 Section 3. TAAC shall report its findings and recommendations to the
12 Legislature in the form of a report and a draft request for proposals no later
13 than November 2, 1990.

14 Section 4. Fifty Thousand Dollars (\$50,000) are hereby appropriated
15 from the Tourist Attraction Fund to the Marine Lab to fund expenses related
16 to the functions of TAAC. The Marine Lab shall administer such TAAC funds
17 separate and apart from all its other funds.

TWENTIETH GUAM LEGISLATURE
1990 (SECOND) Regular Session

ROLL CALL SHEET

Bill No. 999

Date: 5/1/90 *early hour*
2:00 am

Resolution No. _____

QUESTION: _____

| | AYE | NAY | NOT VOTING | ABSENT |
|--------------------|-----|-----|------------|--------|
| J. P. Aguon | | | | ✓ |
| E. P. Arriola | ✓ | | | |
| J. G. Bamba | ✓ | | | |
| M. Z. Bordallo | ✓ | | | |
| D. F. Brooks | ✓ | | | |
| H. D. Dierking | ✓ | | | |
| E. R. Duenas | ✓ | | | |
| E. M. Espaldon | ✓ | | | |
| C. T. C. Gutierrez | ✓ | | | |
| P. C. Lujan | ✓ | | | |
| G. Mailloux | ✓ | | | |
| M. D. A. Manibusan | ✓ | | | |
| T. S. Nelson | ✓ | | | |
| D. Parkinson | ✓ | | | |
| F. J. A. Quitugua | ✓ | | | |
| E. D. Reyes | ✓ | | | |
| M. C. Ruth | ✓ | | | |
| J. T. San Agustin | ✓ | | | |
| F. R. Santos | ✓ | | | |
| T. V. C. Tanaka | ✓ | | | |
| A. R. Unpingco | ✓ | | | |

20

1

TWENTIETH GUAM LEGISLATURE
1989 (FIRST) Regular Session

Introduced

OCT 05 '89

Bill No. 999(LS)

Introduced by:

① J.P. AGUON *JPA*
② L.T.L. GUTIERREZ *LTG*
③ F.S. Gutierrez *FSG*

AN ACT TO ESTABLISH AN ADVISORY COUNCIL
TO DETERMINE THE FEASIBILITY OF
ESTABLISHING A TERRITORIAL AQUARIUM AND
TO APPROPRIATE TWENTY FIVE THOUSAND
DOLLARS (\$25,000) FROM THE TOURIST
ATTRACTION FUND FOR FUNDING PURPOSES

1 BE IT ENACTED BY THE PEOPLE OF THE TERRITORY OF GUAM:

2 Section 1. There is hereby created within the Bureau of Planning the
3 Territorial Aquarium Advisory Council which shall be comprised of the
4 directors of the following Government entities:

- 5 (a) Bureau of Planning;
6 (b) Guam Visitors Bureau;
7 (c) Department of Parks and Recreation;
8 (d) Department of Commerce;
9 (e) Department of Land Management;
10 (f) Department of Public Works, and
11 (g) The University of Guam Marine Laboratory.

12 The Director of the Bureau of Planning shall chair the Council.

13 The Council shall meet to study the feasibility of the establishment of a
14 Territorial Aquarium and shall make recommendations regarding possible
15 funding sources, available sites, proposed structure designs, and possible
16 management schemes.

17 Section 2. There is hereby appropriated from the Tourist Attraction
18 Fund the sum of Twenty Five Thousand Dollars (\$25,000) to the Bureau of

1 Planning for the purpose of funding expenses related to the functions of the
2 Territorial Aquarium Advisory Council.
3 Section 3. The Council shall report its findings to the Legislature
4 within 180 days of the enactment of this Act into law.



JOHN PEREZ AGUON
 SENATOR
20TH GUAM LEGISLATURE
 CHAIRMAN, COMMITTEE ON
 TOURISM & TRANSPORTATION

324 Soledad Avenue, Suite 202, Quan's Building, Agana, Guam U.S.A. 96910 • (671)472-3435, 472-3497, 477-7569 • Fax: (671)477-8358

April 13, 1990

Honorable Joe T. San Agustin
 Speaker
 Twentieth Guam Legislature
 163 Chalan Santo Papa
 Agana, Guam 96910

Dear Mr. Speaker,

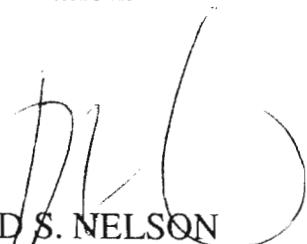
The Committees on Tourism & Transportation and General Governmental Operations, to which the following was referred, wishes to report its findings and recommendations:

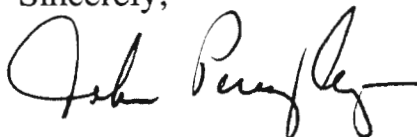
BILL NO. 999 (LS) AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TERRITORIAL AQUARIUM AND TO APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES

The Committee voting record on BILL 999 as substituted by the Committees on Tourism & Transportation and General Governmental Operations is as follows:

| | Tourism & Transportation | GGO |
|---------------------------|--------------------------|------------|
| TO PASS | <u>11</u> | <u>9</u> |
| NOT TO PASS | <u>-0-</u> | <u>-0-</u> |
| TO REPORT OUT ONLY | <u>-0-</u> | <u>-0-</u> |
| TO PLACE IN INACTIVE FILE | <u>-0-</u> | <u>-0-</u> |

Copies of the voting sheets, report and all pertinent documents are attached for your information.


 TED S. NELSON
 Attachments

Sincerely,

 JOHN PEREZ AGUON

TWENTIETH GUAM LEGISLATURE
COMMITTEE ON GENERAL GOVERNMENTAL OPERATIONS

VOTE SHEET ON

on

Bill No. 999

An act to establish an Advisory Council to determine the feasibility of establishing a Territorial Aquarium and to appropriate \$25,000 from the Tourist Attraction Fund for funding purposes.

| Committee Members | To do Pass | Not to Pass | To Report Out Only | Abstain | Other |
|-------------------|---------------|----------------|-----------------------|---------|-------|
|-------------------|---------------|----------------|-----------------------|---------|-------|

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| TED S. NELSON, Chairman | | | | | |
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| HERMINIA D. DIERKING, Vice-Chairperson | ✓ | | | | |
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| ELIZABETH P. ARRIOLA | ✓ | | | | |
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| J. GEORGE BAMBA | ✓ | | | | |
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| --OFF ISLAND-- MADELEINE Z. BORDALLO | | | | | |
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| EDWARD R. DUENAS | ✓ | | | | |
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| CARL T.C. GUTIERREZ | ✓ | | | | |
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| --OFF ISLAND-- PILAR C. LUJAN | | | | | |
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| --OFF ISLAND-- GORDON MAILLOUX | | | | | |
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| DON PARKINSON | | | | | |
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| EDWARD D. REYES | ✓ | | | | |
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| JOE T. SAN AGUSTIN, Speaker | ✓ | | | | |
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| FRANCISCO R. SANTOS | ✓ | | | | |
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| THOMAS V.C. TANAKA | | | | | |
|--------------------|--|--|--|--|--|

VOTING SHEET • COMMITTEE ON TOURISM & TRANSPORTATION

BILL NO. 999 (LS) AS SUBSTITUTED BY THE COMMITTEES ON TOURISM & TRANSPORTATION AND GENERAL GOVERNMENTAL OPERATIONS: AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO STUDY THE ESTABLISHMENT OF A TERRITORIAL AQUARIUM AND TO APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES

TO PASS TO NOT PASS TO REPORT OUT ONLY TO PLACE IN INACTIVE FILE

J.P. Agun

JOHN P. AGUON, Chairman

✓

C. Gutierrez

CARL T. C. GUTIERREZ, Vice Chairman

✓

Joe S. Agun

JOE S. SAN AGUSTIN, Speaker

✓

J. George Bamba

J. GEORGE BAMBA

✓

--OFF ISLAND--

DORIS F. BROOKS

H. Dierking

HERMINIA D. DIERKING

✓

--OFF ISLAND--

PILAR C. LUJAN

--OFF ISLAND--

GORDON MAILLOUX

Marilyn Manibusan

MARILYN D. A. MANIBUSAN

✓ 4/17/90

DON PARKINSON

F. J. Quitugua

FRANKLIN J. QUITUGUA

✓

E. D. Reyes

EDWARD D. REYES

✓

Martha Ruth

MARTHA C. RUTH

Martha Ruth
4/17/90
✓

THOMAS V. C. TANAKA

A. Unpingco

ANTONIO R. UNPINGCO

✓

TWENTIETH GUAM LEGISLATURE
1989 (FIRST) Regular Session

Bill No. 999 (LS)

As substituted by the Committees on
Tourism & Transportation and General Governmental Operations

Introduced by:

J.P. AGUON
C.T.C. GUTIERREZ
E.J.A. QUITUGUA
H.D. DIERKING
T.V.C. TANAKA
A.R. UNPINGCO

AN ACT TO ESTABLISH AN ADVISORY COUNCIL
TO STUDY THE ESTABLISHMENT OF A
TERRITORIAL AQUARIUM AND TO APPROPRIATE
TWENTY FIVE THOUSAND DOLLARS (\$25,000)
FROM THE TOURIST ATTRACTION FUND FOR
FUNDING PURPOSES

M.D. Manibusan
M.C. RUTH
JSAL

1 LEGISLATIVE FINDINGS. The Legislature finds that the Territory of
2 Guam, surrounded as it is by the Pacific Ocean and Philippine Sea, has not
3 adequately explored the opportunities that may be available to present in
4 an attractive, accessible way the rich varieties of aquatic plant and
5 animal life to residents and visitors by means of an aquarium.

6 The Legislature further finds that an aquarium which attractively
7 displays such varieties of aquatic plant and animal life can perform the
8 multiple roles of tourist attraction; teaching tool; research facility, and a
9 location where local residents can go for entertainment and information.

10 The Legislature further finds that the rich cultural heritage of the
11 Chamorro people has many links with the ocean and that those links can be
12 more properly described, displayed and preserved through such a facility.

13 LEGISLATIVE INTENT. The Legislature therefore intends that a
14 Council should be created to plan for the establishment of an aquarium in
15 the Territory of Guam. The Council should be tasked with investigating
16 the various ways and means necessary to create a facility that will serve

1 as a tourist attraction; teaching tool; research facility, and information,
2 entertainment and cultural preservation site. The 1980 study
3 commissioned by Public Law 15-29 should be utilized as a starting point
4 for preparation of recommendations.

5 The Legislature further intends that the Council should investigate
6 all possibilities of financing and managing such a project so that the best
7 possible facility can be built for the people of Guam and report their
8 findings to the Legislature so that an aquarium for the people of Guam can
9 become a reality.

10 BE IT ENACTED BY THE PEOPLE OF THE TERRITORY OF GUAM:

11 Section 1. There is hereby created within the Guam Economic
12 Development Authority (GEDA) the Territorial Aquarium Advisory Council,
13 hereafter known as TAAC, which shall make preliminary plans for the
14 establishment of an Aquarium within the Territory of Guam. The TAAC
15 shall seek information and prepare recommendations regarding possible
16 funding sources, available sites, proposed structure designs, possible
17 management schemes and any other pertinent data and information TAAC
18 deems necessary for the preparation of said recommendations.

19 Section 2. The Administrator of GEDA shall chair the TAAC which
20 shall be comprised of the directors of the following Government entities:

- 21 (a) Guam Visitors Bureau;
- 22 (b) Department of Parks and Recreation;
- 23 (c) Department of Commerce;
- 24 (d) Department of Land Management;
- 25 (e) Department of Public Works;
- 26 (f) The Department of Agriculture, Division of Aquatic & Wildlife
27 Resources;
- 28 (g) The University of Guam Marine Laboratory, and

The Bureau of Planning.

Section 3. The TAAC shall report its findings and recommendations to the Legislature in the form of a report and a draft Request for Proposals (RFP) document no later than November 2, 1990.

5 Section 4. There is hereby appropriated from the Tourist Attraction
6 Fund the sum of Twenty Five Thousand Dollars (\$25,000) to the Guam
7 Economic Development Authority (GEDA) solely for the purpose of funding
8 expenses related to the functions of the TAAC. GEDA shall administer
9 TAAC funds separate and apart from all other funds.

20th Guam Legislature
**COMMITTEE ON
TOURISM and
TRANSPORTATION**

COMMITTEE REPORT

BILL 999 (LS): AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TERRITORIAL AQUARIUM AND TO APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES.

**PUBLIC HEARING:
November 7, 1989**

SENATOR JOHN PEREZ AGUON, Chairman

SENATOR CARL T.C. GUTIERREZ, Vice Chairman

Members:

SPEAKER JOE T. SAN AGUSTIN

| | |
|---------------------------------------|---------------------------------------|
| SENATOR J. GEORGE BAMBA | SENATOR DON PARKINSON |
| SENATOR DORIS F. BROOKS | SENATOR FRANKLIN J.A. QUITUGUA |
| SENATOR HERMINIA D. DIERKING | SENATOR EDWARD D. REYES |
| SENATOR PILAR C. LUJAN | SENATOR MARTHA C. RUTH |
| SENATOR GORDON MAILLOUX | SENATOR THOMAS V.C. TANAKA |
| SENATOR MARILYN D.A. MANIBUSAN | SENATOR ANTONIO R. UNPINGCO |

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COMMITTEE REPORT

**BILL NO. 999 (LS): AN ACT TO ESTABLISH AN
ADVISORY COUNCIL TO DETERMINE THE
FEASIBILITY OF ESTABLISHING A TERRITORIAL
AQUARIUM AND TO APPROPRIATE TWENTY FIVE
THOUSAND DOLLARS (\$25,000) FROM THE
TOURIST ATTRACTION FUND FOR FUNDING
PURPOSES.**

**PUBLIC HEARING BY THE COMMITTEES ON
TOURISM & TRANSPORTATION AND
GENERAL GOVERNMENTAL OPERATIONS**

INTRODUCTION

The Committees on Tourism & Transportation and General Governmental Operations met in a Public Hearing on Tuesday, November 7, 1989, in the Legislative Session Hall on BILL NO. 999 (LS): AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TERRITORIAL AQUARIUM AND TO APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES.

In attendance at the Hearing were Committee on Tourism & Transportation Chairman John Perez Aguon and Sens. Edward R. Duenas and Ernesto M. Espaldon.

Signing up to testify were Guam Visitors Bureau Deputy General Manager Michael Carlson and University of Guam Marine Laboratory Director Dr. Robert Richmond who both provided written testimony. Private citizen Jack Rice testified orally. Supplying written testimony only were Department of Commerce Director Peter Barcinas, Bureau of Planning Director Peter Leon Guerrero, Bureau of Budget & Management Research Director Michael Reidy, Department of Parks and Recreation Director Anthony Mariano, and Department of Land Management Director Frank Castro.

BILL 999 (LS)

Sen. Aguon began the hearing by inviting Carlson to testify. He read from his written statement (appendix F) in support of the Bill. Next to testify was Richmond who provided the Committees with copies of an aquarium feasibility study performed ten years ago (Appendix G), funded by P.L. 15-29 (Appendix H), passed in 1979, which appropriated \$40,000 from the TAF to pay for the study. Richmond said the study was prepared by the firm of Kramer, Chin & Mayo, Inc., of Anchorage, Alaska. He said that the aquarium proposed in the study would be located at the UOG Marine Lab.

Sen. Aguon asked Richmond if the document was complete. Richmond said that it was and that it included possible location, costs and revenue projections and also included plans for a botanical garden and a cultural center.

Next to testify was Rice who made the point that an aquarium operation should start out small and gradually expand, paying its way as it grows. He suggested that rather than have the aquarium constructed next to the UOG Marine Lab, it should be located adjacent to the Agat Boat Basin. He criticized other studies in the past that had been prepared but not executed.

Sen. Aguon asked Richmond why there had been no follow-up on the aquarium project. Richmond said that funding had never been made available and private interest had not been strong enough in the past to go ahead with the project. Sen. Aguon asked if there was a provision in P.L. 15-29 to report back to the Legislature. Richmond said the information was provided to the Legislature.

Sen. Aguon asked how long it would take to update the plan. Richmond said he was not an expert in those matters and suggested that the Council proposed in the bill could take the document and update it. Richmond said that the University was very much behind the project and agreed with the intent of the bill with the possible inclusion of the Department of Agriculture's Division of Aquatic and Wildlife Resources. Sen. Aguon said he hoped the government could update the plan in-house without the need for legislation.

Carlson said that, since the plan required significant updating because of its age, the bill should be passed and the Council should be created to handle that project.

Sen. Espaldon asked Richmond if he felt the private sector should be included in the council. Richmond said that GVB had adequate private representation. Sen. Espaldon asked if the Bureau of Planning was the appropriate lead agency. Richmond said that he had no problem with the Bureau as the lead agency.

Sen. Aguon said that he would prepare a substitute bill that would change the legislation from a bill calling for a feasibility study to a bill calling for studying the existing report and actually establishing the aquarium.

Written testimony presented by the Department of Parks and Recreation (Appendix I) and the Department of Land Management (Appendix J) were in favor of Bill 999.

Written testimony presented by the Department of Commerce (Appendix K) noted that "development of a tourist-oriented marine life display facility at the UOG Marine Lab was listed as a Tourism Capital Improvement Project targeted for FYs '91-'93 in the Overall Economic Development Plan.

Written testimony presented by the Bureau of Planning (Appendix L) suggested that some other agency, such as the Department of Parks and Recreation or the Guam Economic Development Authority be made the lead agency rather than the Bureau of Planning.

There being no other comments, the hearing on Bill 999 (LS) was then concluded.

RECOMMENDATIONS

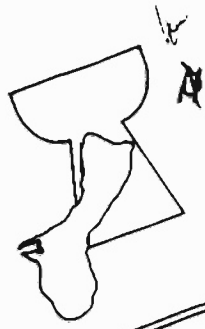
Following the public hearing, further recommendations were made to the Committee on Tourism & Transportation that GEDA be the lead agency and that the 1980 report be used as the starting point for the Council.

The Committees on Tourism & Transportation and General Governmental Operations recommend that Bill 999 be amended to

1. Make GEDA the lead agency;
2. Have the existing 1980 report be used as the starting point of the Council;
3. Include the Department of Agriculture Division of Aquatic and Wildlife Resources on the Council; and
4. Give the Council the authority to take whatever actions are necessary to secure the information they seek.

The Committees on Tourism & Transportation and General Governmental Operations recommend that Bill 999 as substituted be approved by the 20th Guam Legislature.

SENATOR
HERMINIA D. DIERKING
MEMBER OF THE LEGISLATURE



October 6, 1989

FILE

MEMORANDUM

Chairperson, Committee on Tourism &
Transportation
Chairperson, Committee on General Governmental
Operations

FROM: Chairperson, Committee on Rules
SUBJECT: Referrals - Bill Nos. 999 and 1000.

The above Bills are referred to your Committee.
Please note that the referrals are subject to
ratification by the Committee on Rules at its next
meeting.

It is recommended that a joint hearing be
coordinated with the Committees involved.

Herminia D. Dierking
HERMINIA D. DIERKING

Enclosures

CHAIRMAN, COMMITTEE ON TOURISM,
TRANSPORTATION & COMMUNICATIONS

REC'D BY: Janet
DATE: 10-10-89 TIME: 2:01

TWENTIETH GUAM LEGISLATURE
1989 (FIRST) Regular Session

Bill No. 999 (LS)

Introduced by:

- ① J.P. AGUON
- ② D. L. GUTIERREZ
- ③ F.S. [Signature]
- ④ [Signature]

LS

AN ACT TO ESTABLISH AN ADVISORY COUNCIL
TO DETERMINE THE FEASIBILITY OF
ESTABLISHING A TERRITORIAL AQUARIUM AND
TO APPROPRIATE TWENTY FIVE THOUSAND
DOLLARS (\$25,000) FROM THE TOURIST
ATTRACTION FUND FOR FUNDING PURPOSES

1 BE IT ENACTED BY THE PEOPLE OF THE TERRITORY OF GUAM:

2 Section 1. There is hereby created within the Bureau of Planning the
3 Territorial Aquarium Advisory Council which shall be comprised of the
4 directors of the following Government entities:

- 5 (a) Bureau of Planning;
- 6 (b) Guam Visitors Bureau;
- 7 (c) Department of Parks and Recreation;
- 8 (d) Department of Commerce;
- 9 (e) Department of Land Management;
- 10 (f) Department of Public Works, and
- 11 (g) The University of Guam Marine Laboratory.

12 The Director of the Bureau of Planning shall chair the Council.

13 The Council shall meet to study the feasibility of the establishment of a
14 Territorial Aquarium and shall make recommendations regarding possible
15 funding sources, available sites, proposed structure designs, and possible
16 management schemes.

17 Section 2. There is hereby appropriated from the Tourist Attraction
18 Fund the sum of Twenty Five Thousand Dollars (\$25,000) to the Bureau of

1 Planning for the purpose of funding expenses related to the functions of the
2 Territorial Aquarium Advisory Council.

3 Section 3. The Council shall report its findings to the Legislature
4 within 180 days of the enactment of this Act into law.



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**NOTICE OF JOINT PUBLIC HEARING
20TH GUAM LEGISLATURE**

Tuesday, November 7, 1989, 8:30 a.m., Legislative Session Hall. COMMITTEE ON TOURISM & TRANSPORTATION to hear the following:
(Joint with the COMMITTEE ON JUDICIARY & CRIMINAL JUSTICE)

BILL 983 - "AN ACT TO AMEND §8104 (p) OF CHAPTER 8 TITLE 4 GCA, RELATIVE TO INCLUDING AND IDENTIFYING THE GUAM PORT AUTHORITY SECURITY AS UNIFORMED PERSONNEL"

BILL 998 - "AN ACT TO ADD NEW §§10111.1 AND 10111.2 TO 12 GCA CHAPTER 10 AND TO AMEND §8104 (p) OF 4 GCA CHAPTER 8 RELATIVE TO THE PORT AUTHORITY OF GUAM SECURITY FORCE"
(Joint with the COMMITTEE ON GENERAL GOVERNMENTAL OPERATIONS)

BILL 999 - "AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TERRITORIAL AQUARIUM AND TO APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES"

BILL 1000 - "AN ACT TO APPROPRIATE FUNDS TO THE AVIATION POLICY TASK FORCE"
(Joint with the COMMITTEE ON WAYS & MEANS)

BILL 103 - "AN ACT TO ADD A NEW SECTION 8112.2 TO THE GOVERNMENT CODE; TO ADD A NEW §1107.1 TO 12 GCA; TO CREATE THE OVERTIME PAYMENT FUND, AND EARMARK REVENUES FOR THE FUND"

BILL 1018 - "AN ACT TO AMEND 18 GCA §3802 (b) AND §19577 (b) OF THE GOVERNMENT CODE RELATIVE TO VEHICLE SAFETY INSPECTION FEES, A PUBLIC TRANSIT SURCHARGE AND THE PUBLIC TRANSIT FUND"

The public is invited to express their views.
(PA118902 - 1LC)



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BUREAU OF BUDGET & MANAGEMENT RESEARCH
OFFICE OF THE GOVERNOR, Post Office Box 2950, Agana, Guam 96910



MICHAEL J. REIDY
Director

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Senator John P. Aguon
Chairperson, Committee on
Tourism, Transportation
and Communication
Twentieth Guam Legislature
Post Office Box CB-1
Agana, Guam 96910

Dear Senator Aguon:

Pursuant to your letter dated October 18, 1989, transmitted herewith are fiscal notes on Bill Nos. 999, 1000 and 1018.

Should I be of any assistance, please contact my office.

Sincerely,

MICHAEL J. REIDY

Enclosures

cc: Sen. Carl T. C. Gutierrez
Chairperson, Committee on
Ways and Means

CHAIRMAN, COMMITTEE ON TOURISM,
TRANSPORTATION & COMMUNICATIONS

REC'D BY: *Rita Jajon*
DATE: 10/26/89 TIME: 10:50

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FISCAL NOTE
BUREAU OF BUDGET & MANAGEMENT RESEARCH

BBMR-77

Bill No. 999 (T.S.) Date Received Oct. 19, 1989

Mandatory Bill Yes No Date Reviewed Oct. 19, 1989

Department/Agency Affected: Guam Visitors Bureau/Bureau of Planning

Department/Agency Head: Joey Cepeda/Peter Leon Guerrero

Total Fiscal Year Appropriation: \$4,116,612/\$538,457

Bill Title (concise): AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO DETERMINE THE
FEASIBILITY OF ESTABLISHING A TERRITORIAL AQUARIUM AND TO
APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM
THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES.

Change in Law: NONE

Bill Attempts to: Increase Program Funding
 Decrease Program Funding
 Reallocate Present Program Funding

Bill is for: Operations
 Capital Improvement
 Other

FINANCIAL/PROGRAM IMPACT

| <u>PROGRAM CATEGORIES</u> | <u>Minimum Estimated Required Funds (For Five Years)</u> | | |
|-----------------------------------|--|----------------|-----------------|
| | <u>GENERAL FUND</u> | <u>FEDERAL</u> | <u>OTHER</u> |
| <u>Semi-Autonomous/Autonomous</u> | _____ | _____ | <u>\$25,000</u> |
| <u>Government Wide Support</u> | _____ | _____ | _____ |
| <u>GRAND TOTAL</u> | _____ | _____ | <u>\$25,000</u> |

ESTIMATED MULTI-YEAR FUND REQUIREMENTS

| <u>SOURCES</u> | <u>1st</u> | <u>2nd</u> | <u>3rd</u> | <u>4th</u> | <u>5th</u> |
|---------------------|------------|------------|------------|------------|------------|
| <u>General Fund</u> | _____ | _____ | _____ | _____ | _____ |
| <u>Federal Fund</u> | _____ | _____ | _____ | _____ | _____ |
| <u>Other Fund</u> | _____ | _____ | _____ | _____ | _____ |
| <u>GRAND TOTAL</u> | _____ | _____ | _____ | _____ | _____ |

ESTIMATED MULTI-YEAR REALIZED REVENUES

| <u>SOURCES</u> | <u>1st</u> | <u>2nd</u> | <u>3rd</u> | <u>4th</u> | <u>5th</u> |
|---------------------|------------|------------|------------|------------|------------|
| <u>General Fund</u> | _____ | _____ | _____ | _____ | _____ |
| <u>Federal Fund</u> | _____ | _____ | _____ | _____ | _____ |
| <u>Other Fund</u> | _____ | _____ | _____ | _____ | _____ |
| <u>GRAND TOTAL</u> | _____ | _____ | _____ | _____ | _____ |

Serafin P. Siendo
Serafin P. Siendo
PROGRAM ANALYST

M. ...

Date Review Terminated: Oct. 19, 1989

COMMENTS ON BILL NO. 999(LS)

The proposed measure has a fiscal impact in the sum of \$25,000 should it be enacted into law.

This fiscal impact is the funding in the sum of \$25,000 to be appropriated from the Tourist Attraction Fund for the purpose of funding expenses related to the functions of the Territorial Aquarium Advisory Council.

A handwritten signature in black ink, appearing to read 'M. Reidy', is positioned above the printed name.

MICHAEL J. REIDY



Guam Visitors Bureau
Setbision Bisitan Guahan

November 06, 1989

The Honorable John Perez Aguon
 Senator and Chairman
 Committee on Tourism & Transportation
 Twentieth Guam Legislature
 Suite 202, Guan's Building
 324 West Soledad Avenue
 Agana, Guam 96910

Dear Senator Aguon:

This is to submit written testimony on support of Bill No. 999.

The Guam Visitors Bureau's priority list of proposed Capital Improvement Projects (CIPs) includes the development of a Guam aquarium. The estimated project cost was \$10,400,000.00, a substantial investment.

Bill No. 999 proposes to establish an advisory council to determine the feasibility of building a territorial aquarium. This would definitely be necessary in light of the considerable sum of money it would take for this project to materialize.

As in the past, the GVB supports measures that would lead towards enhancing our visitor plant. In view of the competitive nature of tourism, we can no longer rely solely on our sand, sea and sun to entice visitors to Guam. Other competitive tourist destinations offer these. Our thrust should be aimed at making Guam a truly unique destination by complementing our natural attributes with exciting projects such as an aquarium.

Guam's oceans are filled with a wide variety of marine life, many of which can be found only in this region of the world. Should the aquarium project be deemed feasible, the bounty of specimens which can be exhibited would certainly give our island a unique tourist attraction to be enjoyed by our visitors and residents alike.

In this light, we support passage of Bill No. 999.

Thank you for this opportunity to submit written testimony.

Very truly yours,

Michael D. Carlson
 MICHAEL D. CARLSON
 General Manager
 acting

UNIVERSITY OF GUAM AQUARIUM



Kramer, Chin & Mayo, Inc.



Summary Report

SUMMARY

The University of Guam, with plans to build an aquarium, has set up a steering committee and commissioned a feasibility study. This brochure is a condensation of that study.

The aquarium is planned for land which the university owns adjacent to the present Marine Laboratory. The site has some excellent advantages for an aquarium: utilities are available, a natural forest exists, certain facilities and staff can be shared with the Marine Lab, excellent views of the bay and reef can be incorporated into the exhibit.

The new aquarium will emphasize the plants and animals of Micronesia. Planners hope to construct a low impact building which will blend into the site and take advantage of the site's natural beauty. The exhibits will provide a programmed educational experience and the facility will be unique because it combines many of the aspects of a zoological park, botanical garden and bird sanctuary with those of a traditional aquarium. The exhibits will emphasize man's role in the environment and several natural habitats of plants and animals will be presented.

The building will consist of a number of smaller pavilions linked together by covered walkways or underground passageways. Exhibits will include a mangrove swamp, tropical reef, and a living history display. The design will incorporate the use of small, movable tanks in order to keep costs low and provide exhibit flexibility.

If the plans are realized, Guam will have an excellent community educational resource which will enhance the island's tourist economy. About 85 percent of the tourist visitors to Guam are expected to view the aquarium.

Estimates are that the aquarium will contain 40,000 gross square feet, and cost about \$6.0 million to build, with a total project cost of \$10.4 million. It is hoped that the facility can be open to the public by 1984. During the first few years it may have to be subsidized by public and

private donations, but after six years of operation, the aquarium should pay for itself.

The University of Guam will own and operate the aquarium, possibly with a semi-independent Board of Directors. The aquarium will therefore expand the community services made available by the university to the public.

BACKGROUND

In 1978 the University's Board of Regents unanimously agreed to support a feasibility study for an aquarium, and Dr. L.G. Eldredge of the University's Marine Laboratory was named as chairman of an ad hoc planning committee. In June 1979, the Guam Legislature passed Bill No. 203, introduced by Senator Frank F. Blas, and appropriated \$40,000 from the Tourist Attraction Fund for a basic design study for the aquarium. Kramer, Chin & Mayo, Inc. (KCM) has been working on that study for the past four months. KCM has won awards in engineering for the Seattle Aquarium and is now designing and engineering the new aquarium in Honolulu.

Frank J. Piatkowski, A.I.A., is project leader for the University of Guam Aquarium and head of KCM's Alaska operations. Mr. Piatkowski programmed the exhibits for the Seattle Aquarium. This brochure is a summary of KCM's extensive technical report on the University Aquarium.

LOCATION

The Island of Guam is in the Western Pacific about 1,780 miles east of the Philippines, and about 1,500 miles south of Japan. The island is an American territory and strategically important as an airbase.

Guam is approximately 30 miles long and 4–8 miles across, with a population of 110,000 residents including military personnel. The original inhabitants were the Chamorros.

The city of Agana is the capital and major business center. Several tourist hotels are just up the coast at Tumon Bay. The University of Guam is located directly across the island about five miles away from Agana and is easily accessible from the city via good roads.

The site for the new aquarium is adjacent to the University's existing Marine Laboratory, which is approached directly through the campus, down towards the beach. The strategic location of the site next to the Marine Laboratory presents some definite advantages for an aquarium.

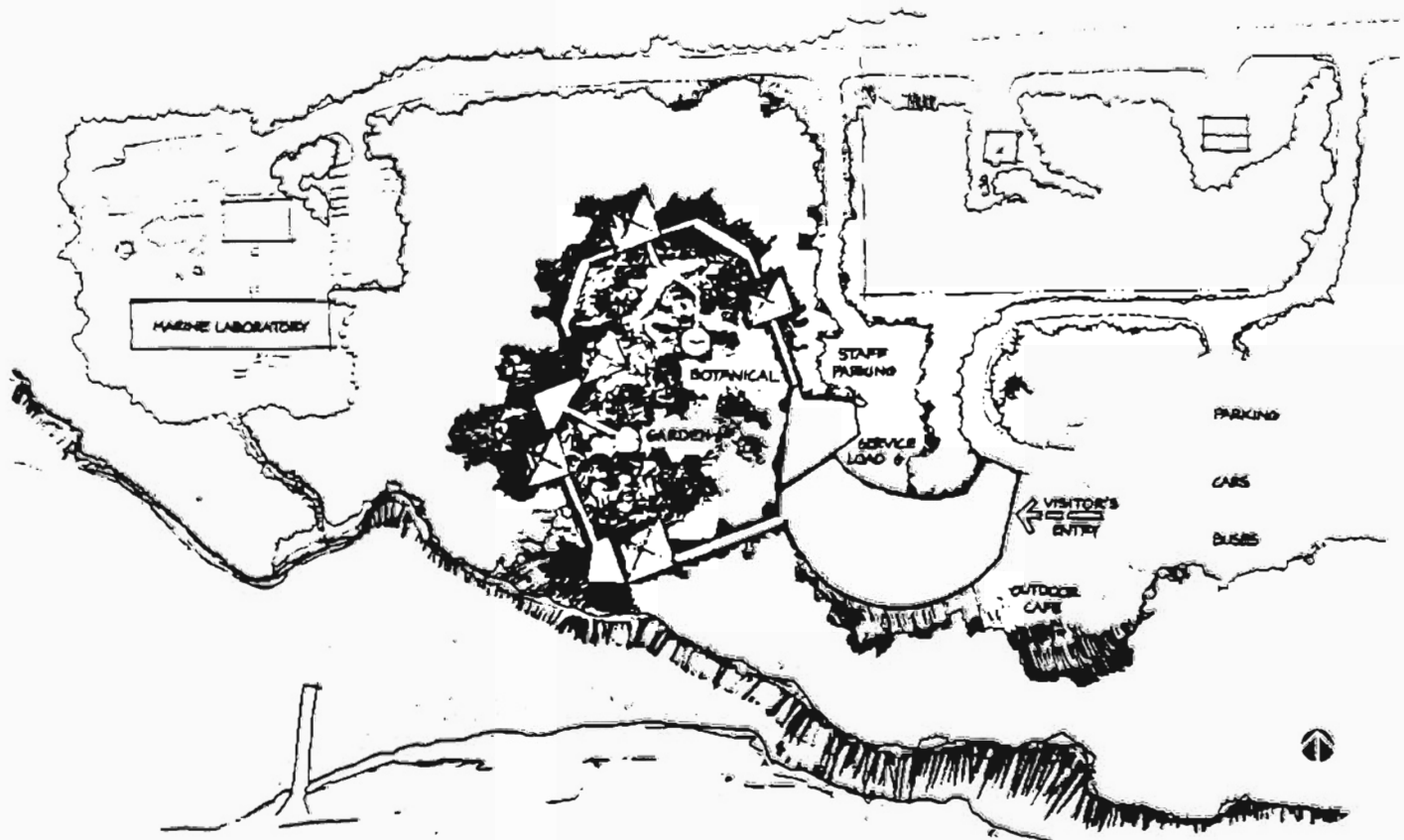
SITE

The starting point for the design of the aquarium is a detailed analysis of the conditions at the site which will affect the proposed structure. There are no serious problems locating an aquarium next to the Marine Lab and indeed there are several benefits:

- Topography provides excellent vistas and views of Pago Reef from the limestone cliffs onsite.

- Seawater wells which can be drilled easily onsite can be shared by the Marine Lab and the aquarium.
- Electric power, telephone, and domestic fresh water are available. It is anticipated that a septic tank will have to be installed, but this system should work quite well since the ground is very porous.
- Some natural protection from wind is provided and the site is high enough above the beach that storm waves should not be a problem.
- The site is one of the few areas on Guam where the vegetation is a natural forest undisturbed by either agriculture or war damage.
- A Chamorro campsite of archeological significance is on the site and can be incorporated as an exhibit.
- Facilities and personnel can be shared.
- The aquarium will provide an additional educational facility for students.

The University presently owns the 7.5 acre site free and clear. The zoning (A-agricultural) does not preclude the aquarium being built with a conditional use permit.



University of Guam Aquarium—Conceptual Site Plan

THEME STATEMENT

The purpose of the theme statement is to set out clearly in the early stages of the aquarium project the philosophy of the building design:

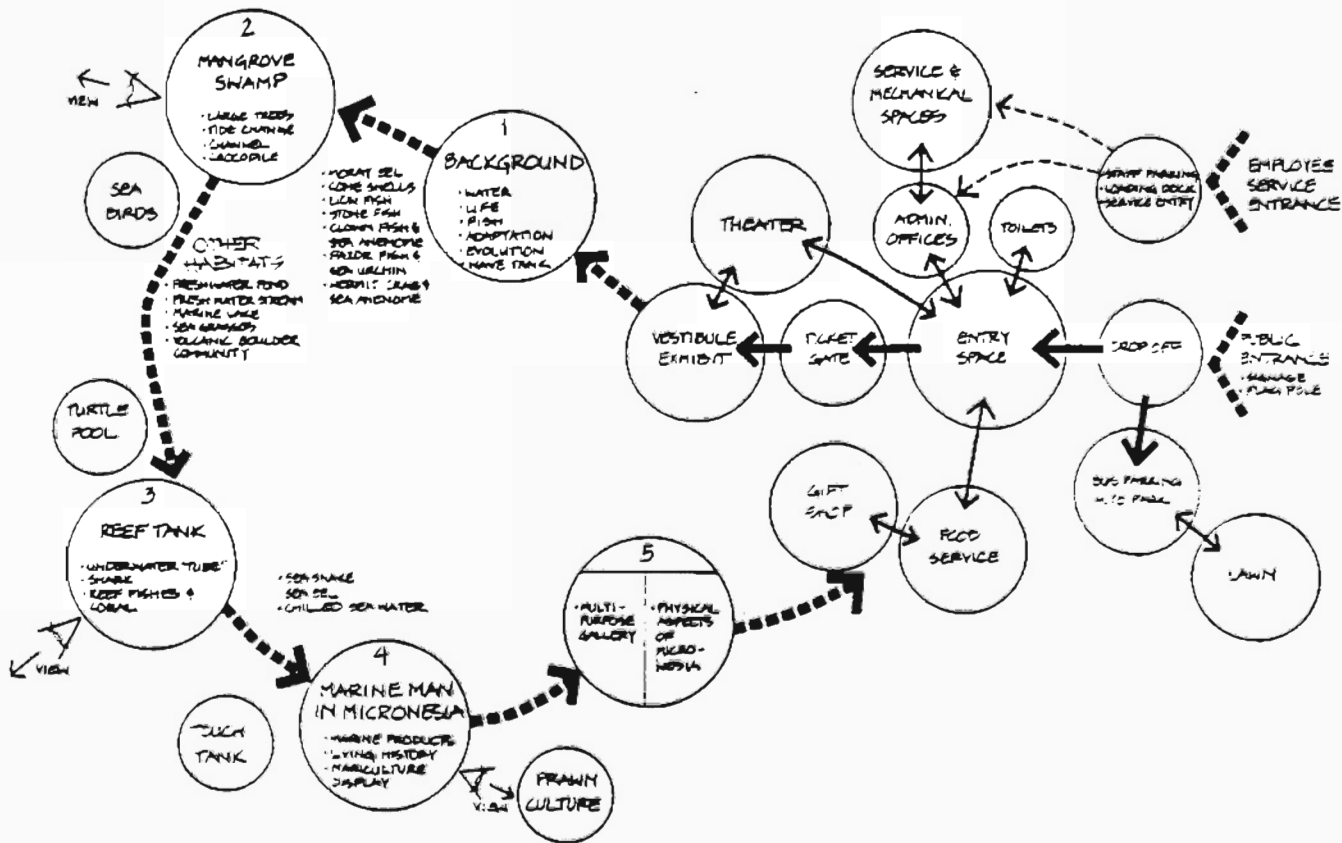
The aquarium will let the visitor experience the many forms of plant and marine life of Guam. The visitor should come away with a new awareness of the diversity and beauty of these resources and hopefully with a commitment to support the protection and maintenance of that environment.

- The aquarium is recognized as an important community asset: as an educational resource and as a tourist attraction which contributes to Guam's economic expansion.
- A major objective of the aquarium is to educate in an entertaining manner.
- The U.O.G. Aquarium will emphasize the plant and animal life of the Indo-West Pacific, especially that of Micronesia, Guam, and Palau.
- Marine plants and animals will be featured in "natural" habitats, designed to interpret and re-create the environment in scaled-down versions of what you would see in the wild.
- Exhibits will be highly graphic and visual with a minimum of text. All text will be in English, Japanese, and Chamorro. The exhibits will be designed to appeal to audiences visually, be informative, and scientifically accurate.
- The exhibits will follow a programmed sequence or story line, each exhibit building on information presented earlier. "Postage stamp" identification of specimens in small light boxes will be avoided.
- The facility will be unique because it combines many of the characteristics of an aquarium with those of a zoological park, botanical garden, and bird sanctuary. It is envisaged as a series of small pavilions linked together by covered walkways and situated in landscaped "natural" habitats.
- The architecture should blend into the site and take advantage of the unique natural environment. Ostentatious and highly visible architecture would be inappropriate. A building which is energy efficient and makes use of latent energy-saving technology can be designed using natural but durable materials.
- Provisions must be made in the building design for Guam's tropical climate, including protection from heat, sun, and rain storms.

STORY LINE

The sequence of exhibits that a visitor will experience in viewing the aquarium is described in the following "walk through" of the proposed facility.

- Most visitors will arrive by tour bus. A large drop-off area will be covered with a canopy to provide shelter from sun and rain.
- From the entry lobby, where there are restrooms and other services, visitors will pass through the ticket gate, pay the entrance fee, and enter the vestibule exhibit. This first key exhibit will set the mood for visitors to enter the underwater world. This area also serves as a lobby for the theater.
- The theater exhibit holds about 150 to 200 people in a small auditorium, where a 20-minute introductory film or slide show is presented. This theater can also be used as a classroom or rented out for community use.
- The first pavilion explores basic concepts of life as related to water (reference will be made to these concepts in later exhibits): suitability of seawater for life, adaptation, evolution, coloration, and other general characteristics for marine plants and animals.
- The second pavilion will house the mangrove swamp exhibit. This natural habitat will have living trees, periodic tide changes, and a channel. The exhibit will include mud skippers, a Palauan salt-water crocodile, plants, worms, fish, shells, and crabs of the swamp and live birds as well.
- The walkway following the mangrove swamp will portray different habitats in small dioramas. These include: volcanic boulder community, sea grass bed, marine lakes, and a stream cross section.



Story Line Schematic

- The largest exhibit in the aquarium is in the third pavilion. It will be a tropical reef tank built like a glass-lined tunnel so observers can "walk through" a reef. There will be many colorful corals, tropical fishes, crabs, shells, and other plants and animals. A resident shark will be displayed and the view out to Pago Reef will be incorporated into the exhibit.
- Other exhibits which will be placed in the connecting walkways between pavilions include:

shore bird exhibit
touch-tank where visitors can pick up a variety of sea creatures
comparison of sea snake and snake eel
chilled deepwater tank
turtle pool
demonstration prawn hatchery and farm

- The fourth pavilion demonstrates man's place and role in the water world. Man's use and misuse of marine resources will be shown. There will be live demonstrations of net making, sea-salt preparation, and the use of marine products from pre-European to modern times.

- The last pavilion features the physical aspects of the western Pacific, demonstrating the formation of the "ring of fire" islands, plate tectonics, volcanoes, earthquakes, and other geological phenomena. A small multipurpose gallery will conclude the exhibits.
- In the walkways between pavilions there will be a number of small aquariums which will depict principles of adaptation through clown fishes and sea anemones, lion fish, moray eels, and other specimens.
- Upon leaving the exhibits, the visitor will have the opportunity to wander through a high-quality gift shop and a food service area which emphasizes seafood and products from the sea.

The administrative areas and building grounds will be designed to complement the facilities already available in the Marine Lab. The life-support systems and staff areas will make it possible for the plants and animals to have proper light, water, soil, diet, and living conditions so that all specimens on display can have a comfortable environment with minimum restrictions. Public areas will be designed for multipurpose use in order to accommodate community functions.

SIZE AND COST

It is estimated that the new aquarium will be approximately 40,000 gross square feet. This area breaks down as follows:

| | |
|-------------------------------------|--------|
| Entry and lobby | 3,700 |
| Theater and vestibule exhibit | 5,000 |
| Pavilions and walkways | 13,000 |
| Food service and kitchens | 4,000 |
| Subtotal public spaces | 25,700 |
| Offices, service areas, and storage | 14,300 |
| Total gross square feet | 40,000 |

There will be parking for 70 employee and student cars, 50 cars in the visitor's lot and 10 tour buses.

When the aquarium is opened in 1984, it is estimated that Guam will attract about 330,000 visitors. About 240,000 of these visitors are expected to visit the aquarium. If another 20,000 Guam residents visit the aquarium, a total of 260,000 visitors can be anticipated in the first year of operation. By 1990 that attendance figure will probably grow to 292,000 or so. The aquarium will average about 650 visitors a day and have a maximum capacity of 200 visitors per hour. Estimated project costs are:

| | |
|---|--------------|
| Land acquisition | \$ 0 |
| Utilities and landscaping | 500,000 |
| Building construction | 6,000,000 |
| Exhibits and equipment | 1,500,000 |
| Administration, design fee, taxes, and contingency | 2,400,000 |
| Total estimated project capital cost | \$10,400,000 |

For the aquarium to pay all of its capital cost from revenues, an admission charge of \$6.75 per person would be needed. It is recommended that a sliding scale attendance fee be charged from \$5.00 for tourists to \$2.00 for children and senior citizens. Based upon projected attendance, ticket prices, and the possibility that half of the capital cost (or \$5.2 million) might have to be paid off by 8 percent bonds

over 25 years, the aquarium revenues and operating costs for 1984 can be projected: The revenue from ticket sales and concession leases will be \$1,260,000 and \$50,000, respectively, and will provide \$1,310,000 total income. It is anticipated that operating and maintenance will cost approximately \$1,040,000, which when added to the yearly debt payment of \$482,000, brings the total expenses to \$1,522,000. Therefore, the annual subsidy necessary would be \$212,000, in 1985 dollars.

All of these assumptions on operation and maintenance costs may change dramatically depending upon support for construction funds, any change in the tourism picture, or unusual management and operating expenses.

The aquarium will provide educational and economic enrichment but is not expected to be financially independent based solely upon revenue from ticket sales. Some form of subsidy may be required, particularly for the first five or six years of operation. It is expected that subsidy would come from the legislature, university, and private philanthropy. Total combined subsidy for the first six years would be about \$726,000.

The most optimistic schedule for securing funding and building the aquarium anticipates that it could be open to the public by early 1984. However, with inflation now over 10 percent, every day of delay adds another \$3,000 to the cost of the aquarium.

The University Aquarium will probably add about \$25 million to the island's economy when it is opened in 1984. About \$21 million of these income and employment benefits would be respent by the local populace in the form of indirect income. By 1990 the aquarium will contribute \$28 million per year or over \$185 million in income and \$157 million in indirect income during the first seven years of operation. This amount of income will be the return on a \$726,000 investment or subsidy required during the early years of operation.

For further information on the project please contact:

Dr. L.G. Eldredge, Chairperson
Aquarium Planning Committee
University of Guam, Marine Laboratory
University Station
Mangilao, Guam 96913

(671) 734-2421

Prepared by:

Kramer, Chin & Mayo, Inc.
1113 W. Fireweed Lane, No. 101
Anchorage, Alaska 99503

Attn: Frank J. Piatkowski, A.I.A.

(907) 276-3303

OFFICE COPY
ELDRIDGE
UOG - MARINE LAB



Kramer, Chin & Mayo, Inc.

UNIVERSITY OF GUAM AQUARIUM PROGRAMMING REPORT

PREPARED FOR
THE UNIVERSITY
OF GUAM



Kramer, Chin & Mayo, Inc.

Consulting Engineers, Architects, Applied Scientists

KCM #055-03



July 25, 1980

Dr. Lucius G. Eldredge, Professor
The Marine Laboratory
University of Guam
P.O. Box EK
Agana 96910
GUAM

Subject: University of Guam Aquarium Programming Report

Dear Dr. Eldredge:

Kramer, Chin & Mayo, Inc. is pleased to submit this report in compliance with our contract between the University of Guam and our firm.

We feel confident the proposed aquarium plan, as presented in this report, will provide Guam with a valuable educational and economic resource benefiting all the island residents. The synergistic relationship that will develop between the Marine Laboratory and the Aquarium is an important consideration in locating the facility close to the lab.

This project has been a stimulating and enjoyable experience for our staff and we are particularly impressed with the high degree of interest in the project as expressed in public meetings, sessions with the Governor of Guam and the personal interest of the president of the university. Kramer, Chin & Mayo offers our continued services to the university in order to see this project through to construction.

Respectfully submitted,

KRAMER, CHIN & MAYO, INC.

A handwritten signature in black ink, appearing to read 'Frank J. Piatkowski', written over a horizontal line.

Frank J. Piatkowski, A.I.A.
Project Leader

FJP:vlb:dae

Enclosures

UNIVERSITY OF GUAM

AQUARIUM

PROGRAMMING REPORT

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| 5. <u>Story Line</u> The sequence and order of presentation of the exhibit information presented as a "walk through" the building. | 5.1 |
| 6. <u>Size and Cost</u> It is estimated that the aquarium will contain about 40,000 square feet and cost about \$6 million in construction cost. | 6.1 |
| 7. <u>Architectural Character</u> The aquarium combines many aspects of a traditional aquarium with those of a botanical garden, zoological park, and arboretum. It is suggested that this building be a low-impact structural statement, which combines a number of small pavilions with partially buried corridors and walkways. | 7.1 |

Appendix

- A Plant Communities and Terrestrial Animals
- B Earl R. Combs, Inc.
"Projections of Visitors and Revenues, Guam Aquarium"
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ABSTRACT

This report presents a detailed preliminary description of the proposed University of Guam Aquarium as developed for the university by the consulting firm of Kramer, Chin & Mayo, Inc. The proposed design begins with site considerations in order to integrate the architecture into the landscape. The proposed facility is responsive to a design philosophy whereby a visitor is exposed to a "programmed" or sequence of exhibits which follow a story line. The report presents detailed theme statements, especially as they relate to construction and exhibits, a proposed story line, and a conceptual site plan. The planned aquarium will not only be an educational resource for the local Guamanian community in cooperation with the university's Marine Lab, but it also will be a significant source of tourist dollars and employment. The report concludes that the aquarium should contain about 40,000 gross square feet of building area and have a construction cost of about \$6.0 million in 1983 dollars. The total project cost is about \$10.4 million.

SECTION 1 LOCATION

GENERAL

Guam is located in the Western Pacific Ocean at approximately latitude $13^{\circ} 28'N$, and longitude $144^{\circ} 45'E$. It lies about 1,200 nautical miles east of the Philippines, 1,500 miles south-southeast of Japan and 1,000 miles north of New Guinea. This volcanic island is the largest and southern-most of the Mariana Island chain. It is 30 miles long, varies in width from 8 miles to 4 miles at the waist, and contains 209 square miles of area excluding reefs (see Figure 1).

SITE LOCATION

The proposed site for the aquarium facility is located midway along the leeward coast of the island at Pago Bay, immediately north of the University of Guam, Marine Laboratory (see Figure 2). The site includes the high limestone cliff at Taogam Point and the land south of this point sloping very sharply down to the bay, affording an excellent view of Pago Reef, Pago Channel, and across the bay to Pago Point.

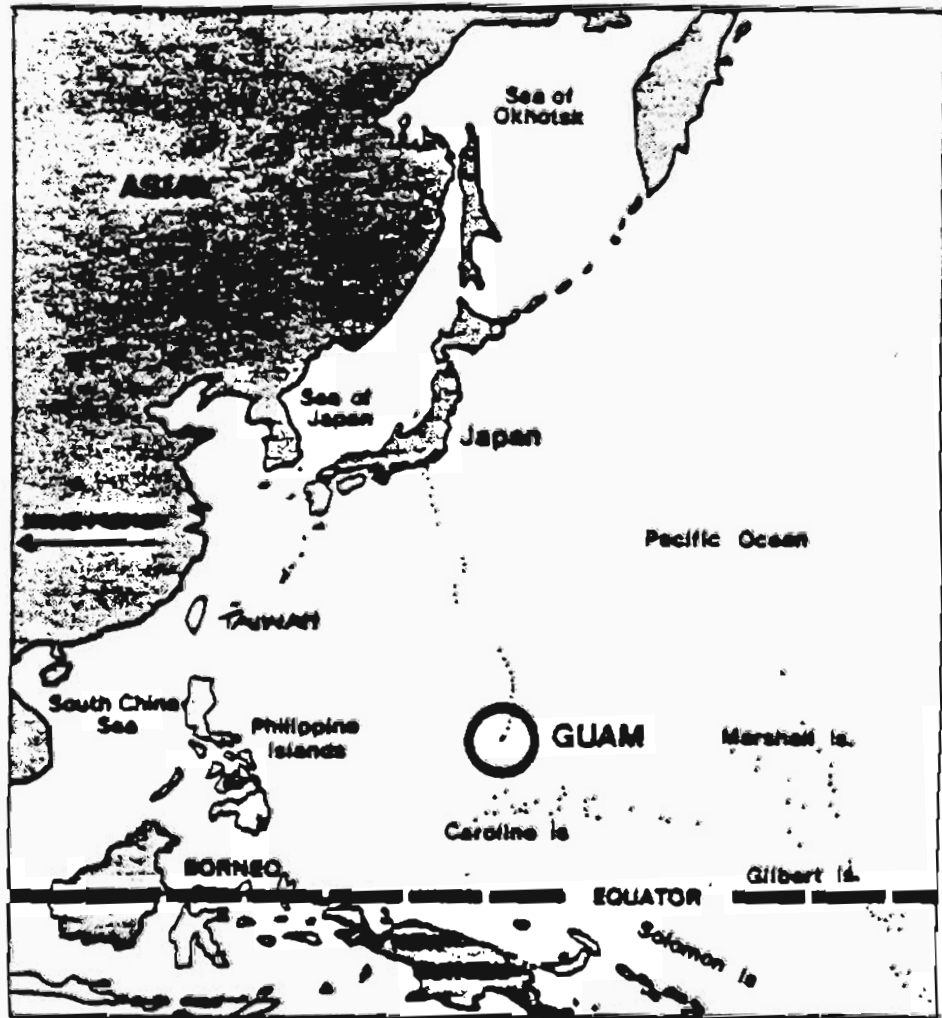


FIGURE 1.

LOCATION OF GUAM

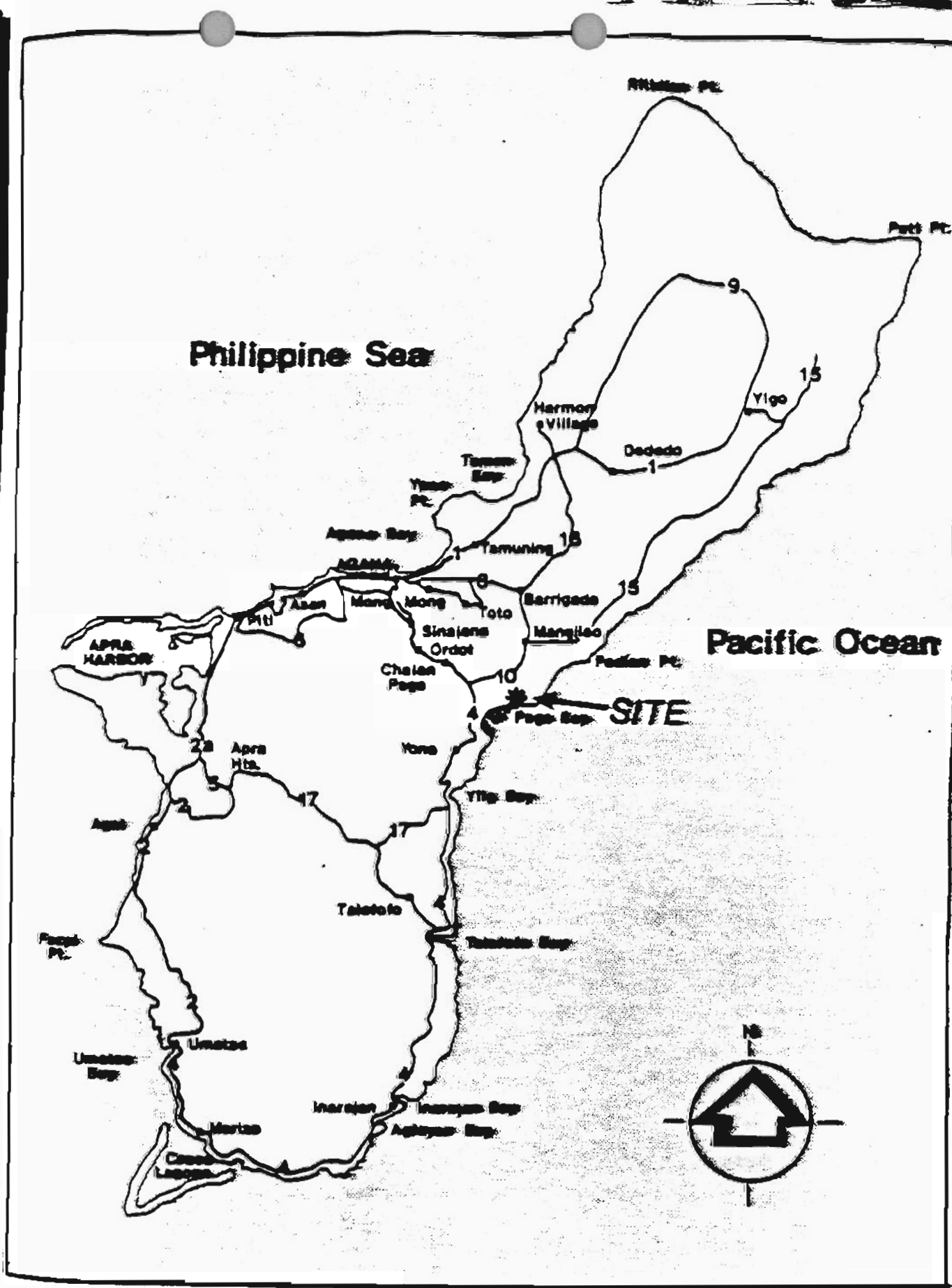


FIGURE 2. SITE LOCATION

Our study will outline concept and design of an aquarium, as well as construction and operation and maintenance costs.

Sources for construction funding have not been completely identified at this time. We need to know how much it will cost before we can approach anyone for funding. I sincerely hope that our efforts will be those of the people of the island.

Sincerely,

L. G. Eldredge

SECTION 2 BACKGROUND

In the past several years there have been four or five different proposals for public and/or private aquariums on the Island of Guam. One or two of these proposals progressed as far as the planning stage but for various reasons, usually having to do with construction funding, the projects were never built.

The background and history of the University of Guam Aquarium can best be summarized by a letter written by Dr. Lucius G. Eldredge, coordinator of the project and published in the Pacific Daily News on February 28, 1980 (p. 19).

Dear Editor:

Your editorial (Feb. 20) about an island aquarium brought several points to mind. We are not trying to keep our aquarium plans a secret. We want to have something positive to report when the time is appropriate. Now may be the time. As a way of leading into the current status of our project, I'd like to share some of our previous planning efforts.

Members of the University of Guam Board of Regents met informally at the Marine Laboratory during the early winter of 1977. At that meeting Regent Pedro P. Ada suggested that the Marine Laboratory investigate the possibility of establishing a public aquarium. Following that meeting I was appointed coordinator to plan a theme statement. In late April 1978, after attending a meeting in Hawaii, I traveled to the West coast to visit and meet with the directors of the Scripps Aquarium and Sea World in San Diego, Steinhart Aquarium in San Francisco, the new Seattle Aquarium, and the Vancouver Aquarium, as well as the Waikiki Aquarium and Sea Life Park in Hawaii. I also visited several zoos, museums and science centers. The result of this visit and extensive revisions of thoughts has resulted in the "notes for a university aquarium." This remains the preliminary idea.

At their meeting on November 1, 1978, the Board of Regents unanimously agreed to support a feasibility study for a public aquarium at the university. Earlier ideas about an aquarium led to many discussions with Martin Pray for the Guam Visitors Bureau. Bill No. 919 was introduced to the 14th Guam Legislature in the late fall but was never "heard." An ad hoc Aquarium Planning Committee, as constituted by President Rosa Roberto-Carter to include L. G. Eldredge (chairman), J. A. Marsh Jr., R. H. Randall, and R. T. Tsuda of the university, and H. T. Kami of Guam's Division of Aquatic and Wildlife Resources, met briefly on February 13 to discuss plans. An "aquarium society," which would act as a community working group, was discussed. Invitations to the aquarium society would be made after meeting with President Carter and Regents' Chairman Ada. I have talked informally with many people to be included to date.

SECTION 3 SITE

This report does not concern itself with selecting alternate sites for the University of Guam Aquarium. A site for the facility has been selected and this Programming Report concerns itself primarily with the design program of the aquarium and the theme for the building. Site, of course, is a very important consideration in the programming of the aquarium. The discussion which follows points out in detail the different conditions influencing the aquarium programmed for the site. In general, the site is quite compatible and in a good location for an aquarium.

The only distinct disadvantage to the site which has been expressed is its location away from downtown Agana and the major tourist hotels in Tumon Bay. To compare the university site with any other site is, as was noted, beyond the scope of this report. The university site presents no serious problems, and there are very distinct advantages. In other words, it is an ideal place to build an aquarium as planned.

OWNERSHIP

Figure 3 is a small-scale site plan showing the approximate location of the property lines. Except for a small parcel of privately owned land, the University of Guam has title to all of the land between the paved road and the ocean shore (see Figure 3).

GENERAL CHARACTERISTICS

The site is part of a broad limestone plateau, typical for the northern portion of the island. There are no streams in this area since the limestone is highly permeable allowing water to filter down creating a freshwater lens that floats on salt water (see Figure 4).

GROUNDWATER

As mentioned above, the site is underlain by a freshwater lens with a water table from 1 to 5 feet above sea level. If this lens is tapped to provide fresh water for the aquarium facility, it would be expected to contain 30 to 400 ppm of chloride. Seawater intrusion may occur if pumping rates exceeded 50 to 100 gallons per minute.

Because the freshwater lens is used by Guam as a reservoir to provide water for the island, any proposed use of the groundwater would require the filing of an environmental impact statement.

SOILS

Two soil groups are found on the site corresponding to the upland plateau and the seaward-sloping areas. Both are considered clayey silt (ML), with slow surface drainage and free internal drainage. The underlying porous white limestone rock is at a depth of from 0 to 6 inches below the surface (see Figure 5). The upland plateau consists of patches of thin, reddish or brownish, granular clay among pinnacles,

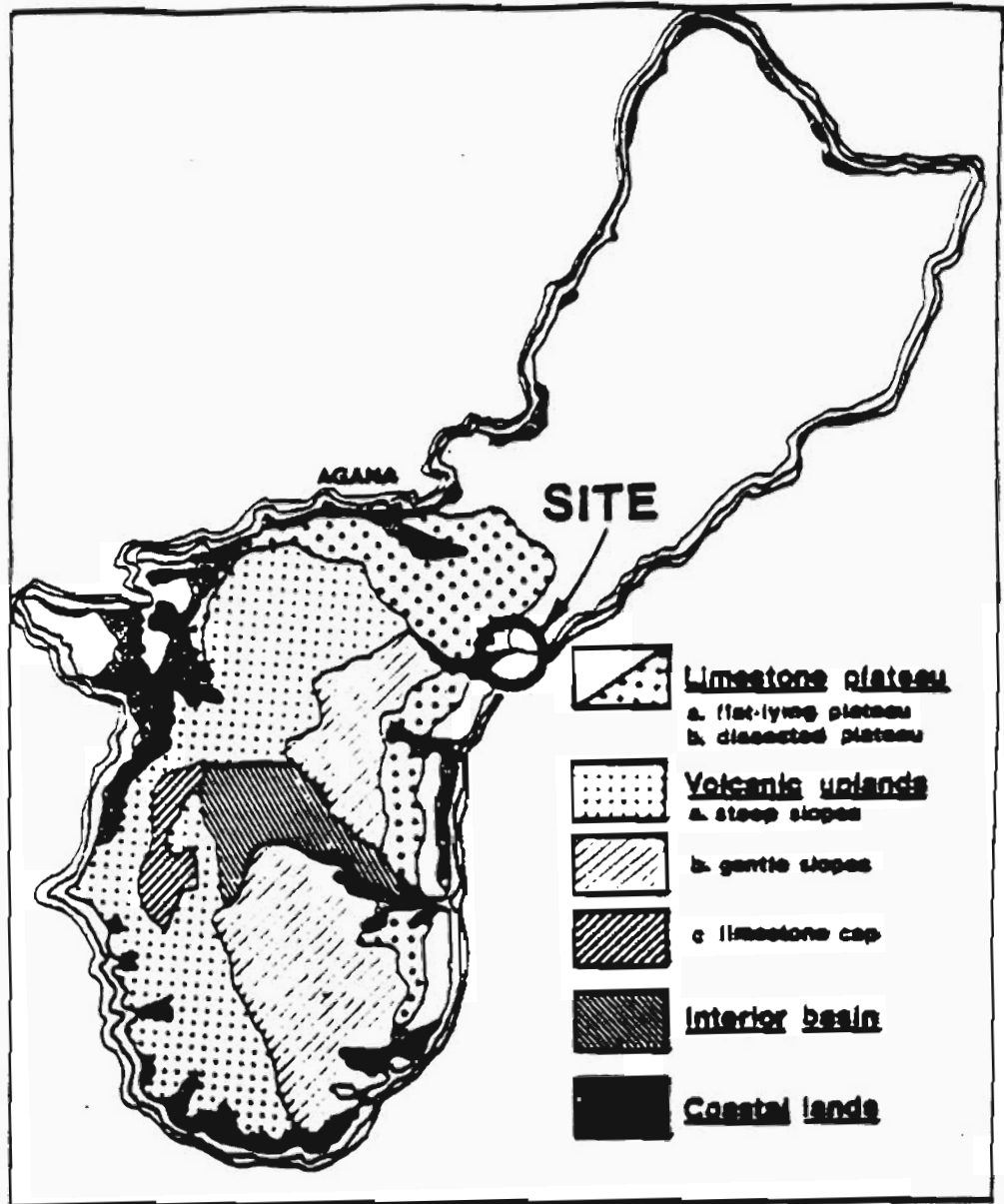


FIGURE 4.

GEOLOGY OF GUAM

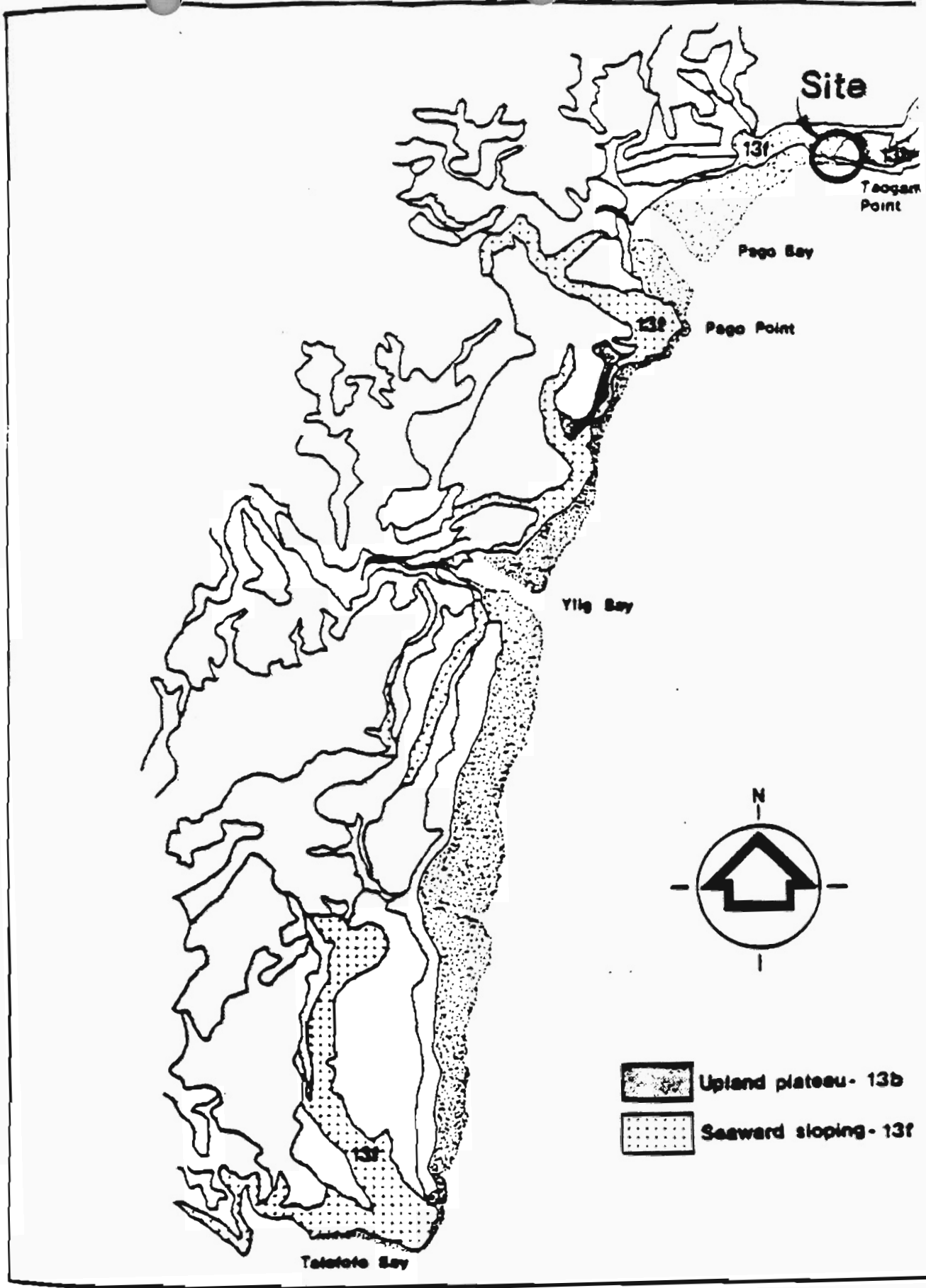
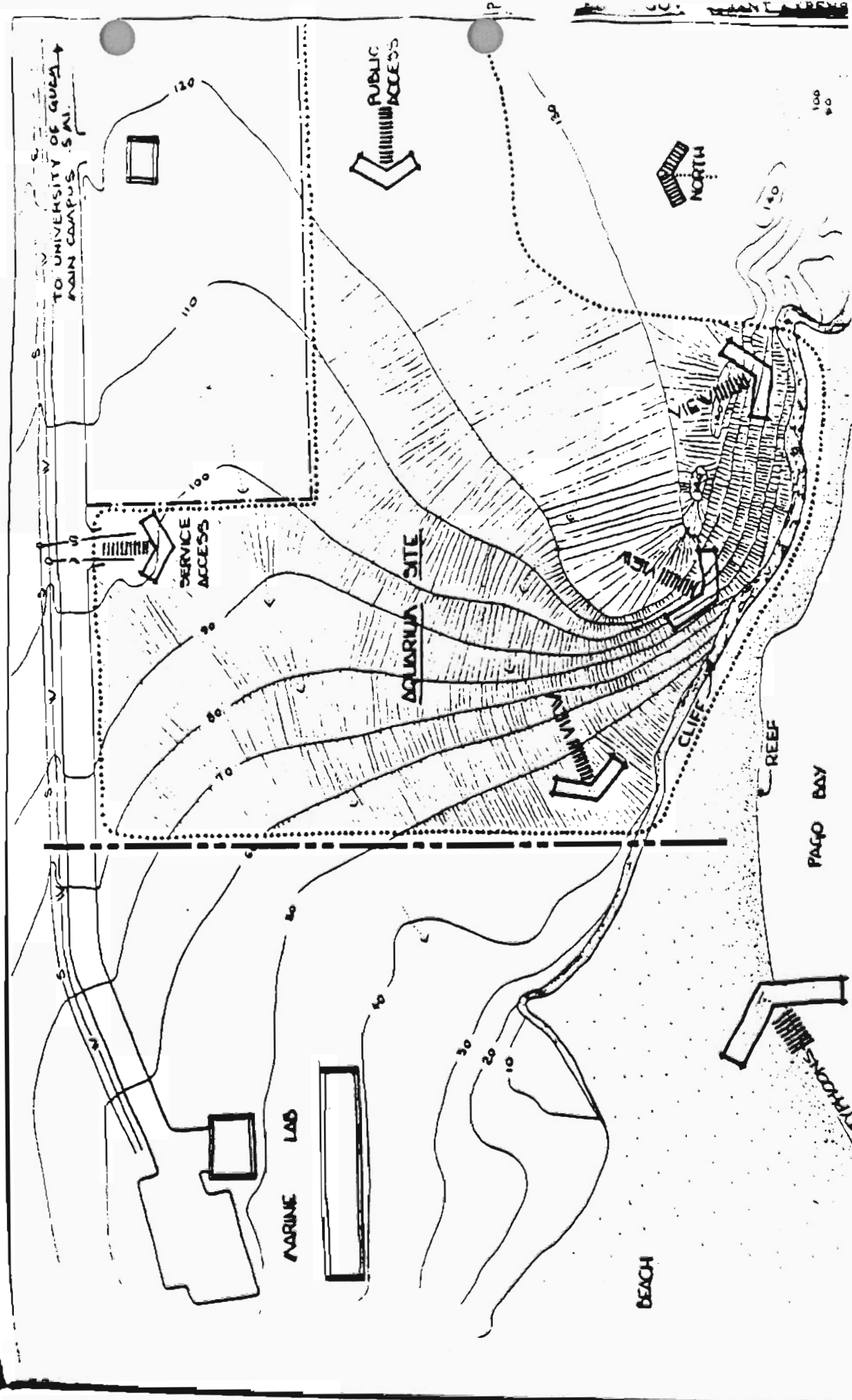


FIGURE 5. SOILS NEAR SITE



SANITARY SEWER

The island does have a sanitary sewer system with treatment facilities. However, it has not been extended to the vicinity of the site.

The Marine Laboratory uses a septic tank and drainfield system which has proven effective. A similar system is anticipated for the aquarium.

EXHIBITS DISCHARGE

Water flowing through the various exhibits containing animals picks up various wastes, such as fecal matter and uneaten food, and is depleted of its dissolved oxygen. This used water cannot be reintroduced into the exhibits without costly filtration and aeration.

Since an adequate quantity of water is available to supply the exhibits, it will be used once and then discarded. This system will also prevent a disease which may develop in a particular tank or exhibit from spreading to other exhibits.

This discarded water will be discharged directly into the ocean, after obtaining a permit from the Environmental Protection Agency. A new permit is required, or the existing permit granted the Marine Laboratory may be modified to include the aquarium.

SALTWATER SUPPLY

A great many of the exhibits require salt water to sustain the animals. With the ocean adjacent to the site an intake line and pump system would deliver all the salt water required to sustain the facility. However, a facility such as this demands that the water supply be reliable. Extended loss of the saltwater supply would have disastrous consequences.

A saltwater intake and submerged pipeline would be extremely vulnerable during a typhoon. For this reason, saltwater wells are proposed for this facility with the pumps tied into the standby generation system.

Permits for these wells will be required by the Guam Building Permit Office prior to the start of the actual drilling operation.

TELEPHONE

Telephone service exists at the Marine Laboratory. This service will be extended, underground, to the aquarium.

EARTHQUAKES

Guam is designated Seismic Zone 3, signifying that it is possible to experience a major earthquake.

Typhoons can occur in the vicinity of Guam any month of the year but increase in frequency during the wet season. Records show that in any particular year, the chances are two in three that one or more typhoons will pass within 120 nautical miles of the island, and one in three that one or more typhoons will cause considerable damage with their intense winds, storm waves, and flooding rainfall. Typhoons may also sweep water onshore producing a localized storm wave. The principal cause of erosion and redistribution of sediment is typhoons.

Typhoons will almost always move across Guam from east to west or from southeast to northeast. Those occurring in January through May are usually small with winds in excess of 75 miles per hour and extend outward from their centers 25 to 50 miles. Typhoons occurring in December, May, June and July are larger with high winds extending from their centers 50 to 75 miles. The largest and most intense typhoons normally occur from August through November. Their outward reach may be 100 miles, with sustained wind speeds of 150 miles per hour occurring within 25 miles of the center of the storm.

RAINFALL

Guam's mean annual rainfall ranges from less than 90 inches at Apra Harbor to more than 110 inches in the mountains. Year-to-year rainfall, at any one area, will vary greatly; however, a maximum of 119.5 inches was recorded at Agana in 1916 and a minimum of 57.14 inches in 1926.

The most intense rainfall occurs during typhoons. In October 1953, the greatest intensity was recorded during the passage of Typhoon Alice: 26 inches for one day and 48 inches for two days.

Rainfall of more than 20 inches in 24 hours and more than 30 inches in 48 hours has occurred at least twice in the last 50 years. One inch of rain per hour is expected to happen several times each year on Guam. Two inches or more per hour is rare, but will occur once or twice each year.

TEMPERATURE AND HUMIDITY

Location and elevation are major factors influencing the temperature of a particular area. Localities along the eastern coast exposed to the tradewinds are generally cooler than localities on the west coast. Sea level areas will typically be 3 to 4° F warmer than the mountain tops.

Temperature extremes vary from a recorded maximum of 95° F to a minimum of 64° F. Typically, however, temperatures rarely exceed 90° F or fall below 70° F.

The coolest period during the year is January and February, the warmest, May and June. The temperature differential between these periods is slight however, with monthly averages of less than 3° F. Throughout the year, daytime temperatures are commonly between 83 and 88° F and in the mid seventies during the coolest part of the night.

bats. A large proportion of the animals found on the island today were introduced by man. Many animals do not have Chamorro names because of their recent introduction into Guam.

The limestone forest on the site will contain several species of animals. Some of them will be incorporated into the exhibits. A listing of the major terrestrial animals is included (see Appendix A).

BIRDS

A large number of seabirds and shorebirds visit the island each year. Sixteen varieties are native to Guam.

A shorebird exhibit will be included in the visitor's experience. In addition, it is anticipated that certain other exhibits, such as the mangrove swamp, will incorporate some of the birds associated with that environment.

A listing of the most common birds to Guam is included (see Appendix A).

SECTION 4 THEME STATEMENT

Early on in the process of preparing this programming report, the consultant conferred with Dr. L.G. Eldredge and developed the following theme statement. The theme statement, and the story line as contained in Section 5 of this report, formed the basis for a public presentation given on the University of Guam campus, March 1, 1980. Portions of the report were televised, articles appeared in the local paper regarding the aquarium, and input was received from the public in developing the initial programming and design concepts.

The purpose of the theme statement is to set out as clearly as possible in the early stages of the aquarium project the philosophy and intent of the building program and later design work. Emphasis is placed on decisions affecting displays and operation of the facility.

A key function of the theme statement is that it serves as a touch-stone for later decisions. Its very easy, once the architects, engineers, and exhibit designers get involved in the detail of the aquarium to forget some of the basic ideas that went into the project at the beginning. It may seem like a remote possibility at this time, but somewhere down the line, someone may ask, "Why aren't there any penguins at the Guam Aquarium?" and we can look to the theme statement and note:

"The University of Guam Aquarium will emphasize the plant and animal life of the Indo-West Pacific, especially that of Micronesia, Guam, and Palau."

So we write down this theme statement at this time not only to sharpen our thinking at the start of the project but to keep in sharp focus later. The value of the theme statement is not so much for understanding the program presented in this report as much as it is for the interpretation by later planners in the aquarium's development.

EMPHASIS

The University of Guam Aquarium will emphasize the plant and animal life of the Indo-West Pacific, especially that of Micronesia, Guam, and Palau.

EDUCATE AND ENTERTAIN

The major objective of the Aquarium is to display marine plants and animals in "natural" habitats. The purpose of the habitats is to interpret and explain the environment to visitors in an entertaining and compelling manner. The aquarium will be an educational experience, but "painless" education since a sterile textbook approach will be avoided and natural settings, graphic displays, and a minimum of text material will be used.

AUDIENCES

In 1979, Guam attracted 260,000 visitors. An increase is projected for future years. It is our hope that well over half of these visitors will tour the new aquarium. Guam has a population of 110,000, including United States military personnel. It is

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Placing the aquarium close to the existing Marine Laboratory allows the staff, personnel and physical facilities, such as classrooms, laboratories, and supplies. The aquarium will expand the research opportunities for university students and also will expand the services that may be available to the community and citizens of the island.

UNIQUE FACILITY

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The aquarium will combine many of the characteristics of a zoological garden, botanical garden, and aquarium. It is envisioned as a series of covered walking small building modules that contain views out onto the "habitat," interactive exhibits, and aquariums. Plants, fish, birds, and other small animals will be identified and explained in each of these building modules while the natural setting will provide a backdrop for the displays.

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SETTING

The land adjacent to the Marine Laboratory at the University of Guam, particularly attractive as a site for the aquarium. The site contains a number of indigenous trees and plants, an ancient Chamorro habitation site is on the land. A survey conducted by the Smithsonian Institute showed that the site has many trees and plants which have not been disturbed by development or war damage. Unlike most of the land in Guam, the site therefore is close to an original, unaltered "natural" condition.

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The shoreline provides many different habitats, from sandy beach to rocky shore. From the high point on the site, there are excellent views of Pago Bay, Pago Reef, and the channel cut by the Pago River. The closeness of the Marine Laboratory makes it possible to incorporate into the exhibit some of the experiments being conducted in the labs. There may be, for example, a "Marine Lab Newsbrief" exhibit which is changed periodically, highlighting through text and photographs the latest projects being pursued in the labs.

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LONG-TERM OBJECTIVE

By becoming better informed about the natural environment of Guam through visits to the aquarium, it is hoped the public will be better able to make decisions concerning use of the environment. The creation of an informed public and encouragement of a conservationist ethic will constitute the most significant long-term objective of the aquarium.

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LIFE RELATIONSHIPS

The basic element of display will be living specimens. An understanding of the total environment comes from a knowledge of how plants and animals relate to their natural surroundings, to each other, and to man. Man's influence on various habitats will be recognized and his potential for both good and bad defined. The exhibits will focus on these relationships.

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LIVING AND GROWING CONDITIONS

The design will provide for light, water, soil conditions, living space, water quality, temperature, and diet so that all plants and animals on display will be comfortable and their restriction minimized.

DESIGN GOAL

The aquarium will put the viewer vicariously "into" the various habitats of Guam. The intent is that the viewer come away impressed with the diversity and beauty of this resource and with his own desire to protect and repair the environment strengthened.

PARKING

Parking for tour buses, automobiles, staff vehicles, and delivery vehicles must be provided in order not to adversely impact the university or the Marine Laboratory. Separate areas for visitor parking and entrance and staff parking, service entrance, and loading dock will be provided.

MARINE SCIENCE COMPLEX

The aquarium, together with the Marine Laboratory, makes up what may be conceived as a marine science complex. As this idea takes hold and begins to grow, the following are functions that may develop:

- o Tropical marine resource library
- o Micronesian conference center and marine studies institute
- o Expanded marine science education program
- o Visiting scholars program
- o Micronesian information center
- o Planetarium, observatory, and science center

SECTION 5 STORY LINE

The traditional aquarium presents information in a large gallery with viewing tanks "pasted" up against the wall. A "postage stamp" collection of light boxes provide a photograph and taxonomical description of the many specimens displayed. This is not to criticize the traditional aquarium; it is a well-respected display concept and, if done well, it can be entertaining and educationally valuable.

In the Guam Aquarium, however, the visitor will be given information in a more programmed format. Rather than entering a large hall and wandering randomly through the exhibits, material will be presented to the viewer in a specific sequence with a beginning and an end, in an established order. The visitor will be cognizant of a storyline which guides one's trip through the exhibits.

The following figure presents a diagrammatic display of the elements, or topics, to which a visitor will be exposed when traveling from the entrance gate through to the exit (see Figure 7). It may be helpful, while reading the short description which follows, to refer to the diagram in order to better understand the programmed nature of the storyline. The storyline was prepared with the assistance of notes prepared by Dr. L. G. Eldredge. (See Section 7, Architectural Character for Schematic Site Plan.)

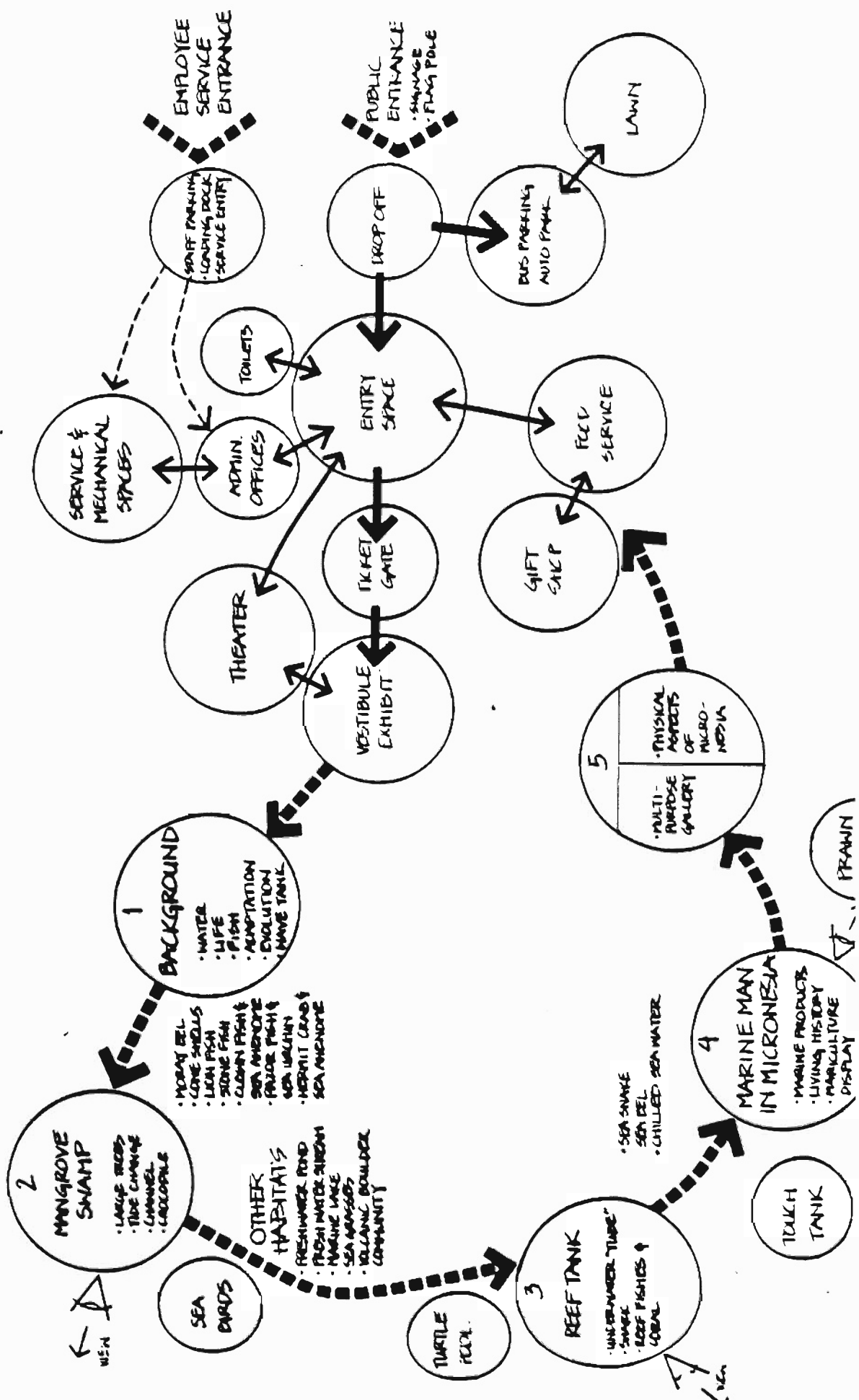
VEHICLE APPROACH

The entrance to the aquarium will be via an existing access road that passes through the university campus, close by the administration building and down a steep winding grade to the existing Marine Laboratory. At present, just before arriving at the Marine Laboratory, one passes a small private residence; the entrance to the aquarium will be before one reaches this residence.

There will be a new intersection created at the entrance which will direct public traffic to the left off the existing main road and into the site on a new larger road which will go behind the residence that is there now. From the entrance to the Marine Lab the present road will be a service drive only. Thus, from a point about 500 yards from the lab and just after the turn down the hill, traffic is separated into a public entrance and an employee/service entrance.

Most visitors to the aquarium will enter by tour bus or private automobile. The parking and drop-off areas will be designed according to the principles of "see, arrive, and park." In other words, as one approaches the building, signs and other visual cues will direct the driver to an overall vista or sense of "seeing" the whole building. There will be a drop-off point for cars and buses under the building's entrance canopy. From there the driver can park his or her vehicle and join the passengers in the drop-off area.

Staff, employees, and service vehicles will enter the complex down the existing entrance road to the Marine Lab. Parking, loading docks, service areas, garages, boat storage, administrative offices, classrooms, and lab areas will be close to and in some cases shared by the existing lab. The general public will not have access to these areas.



The whole purpose of this first exhibit is to quiet the kids, get them prepared, and set the stage.

The vestibule exhibit also has a less subtle function — it serves as a lobby theater.

THEATER

While the configuration of the theater provides many opportunities for the building designer, the general appearance of the room is similar to a small theater. It will have a minimum seating capacity of 150 fixed auditorium seating with folding table arms so it can be used as a lecture hall. There will be a raked or tiered floor for good sight lines, an enclosed projection booth and possibly the capability to project visual images on more than one wall for multimedia presentations. There will be no windows in the room and it will be one of the few completely air-conditioned areas in the aquarium.

The normal visit to the aquarium would involve a 10- or 15-minute film or video introduction to the aquarium exhibits. There will be provisions where the theater can be bypassed if one does not care to wait for the film. The theater could be used as a classroom by the university or rented out to the community for films or lectures.

The remainder of the exhibits consist of a sequence of modules or pavilions a total of 20,000 net square feet in area which are connected by stretches of corridors that lead out onto the site and take advantage of the natural surroundings. The pavilions are somewhat dark, enclosed spaces with the only light being that on the plants and animals in the aquaria and an occasional "panorama window" view into a selected area of the site. The corridors, on the other hand, will be open-air walkways, which in some cases may be buried under slopes or rock overhangs in order to minimize their impact on the site (see Figures 8 and 9). The walkways follow the contours of the site as they descend to the beach below.

The overall effect of the building will be to minimize its impact on the site and to maximize the visitor's viewing angles of the arboretum park-like natural setting. The viewer will be taken into the world of plants and animals rather than being overwhelmed by the architecture. Accomplishing this while going from areas of bright sun to darkness several times will be a major challenge for the exhibit designers and building architects.

BACKGROUND

The first pavilion concerns itself with basic concepts concerning the existence of life and water. In addition, species survival adaptations and evolutionary concepts will be expressed. This exhibit area serves as an introduction and background for the major habitats which are to follow. Some of the animal example species will be repeated in later major exhibits to help exemplify the complexity of life in Micronesia's tropical waters.

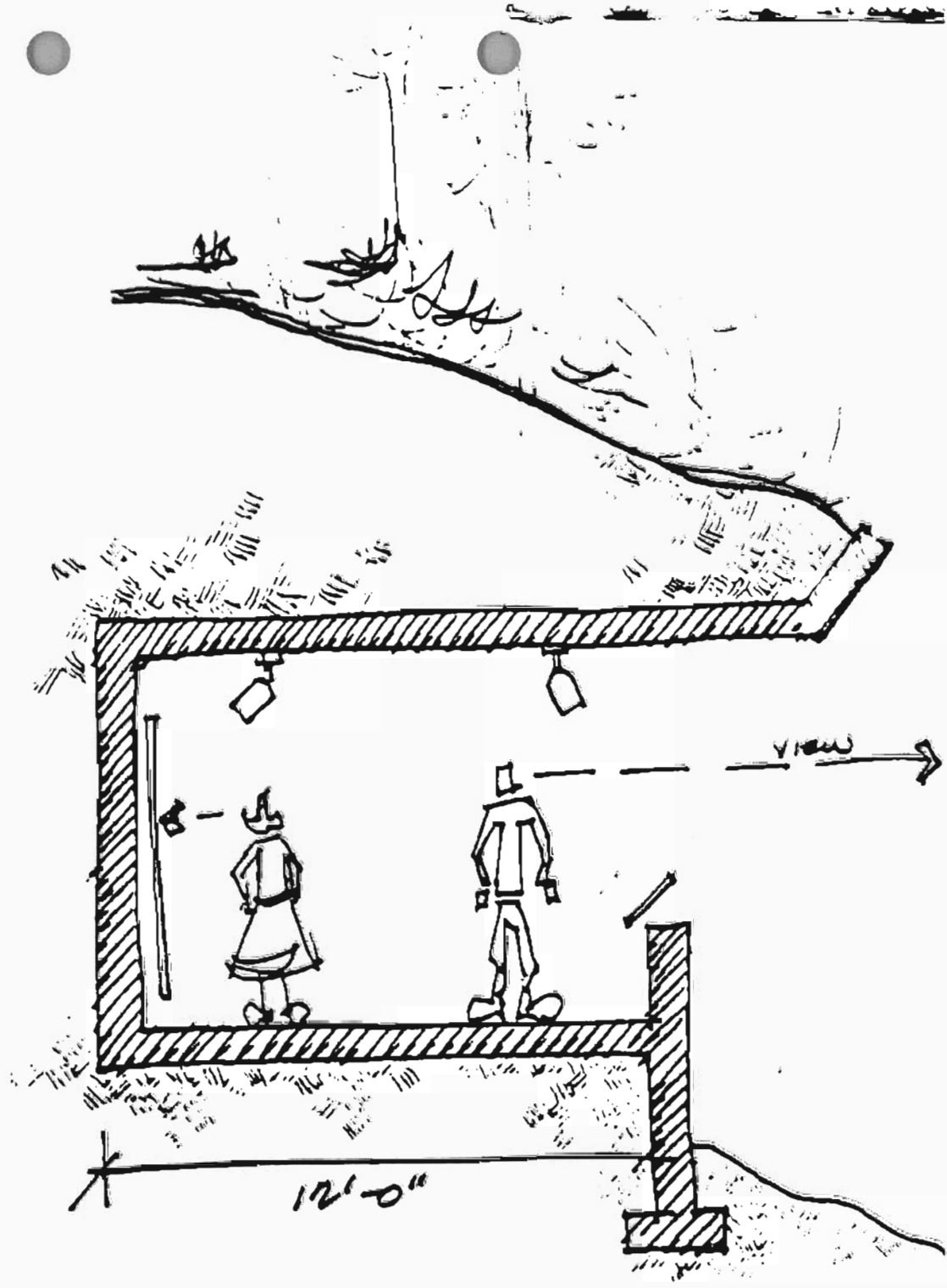
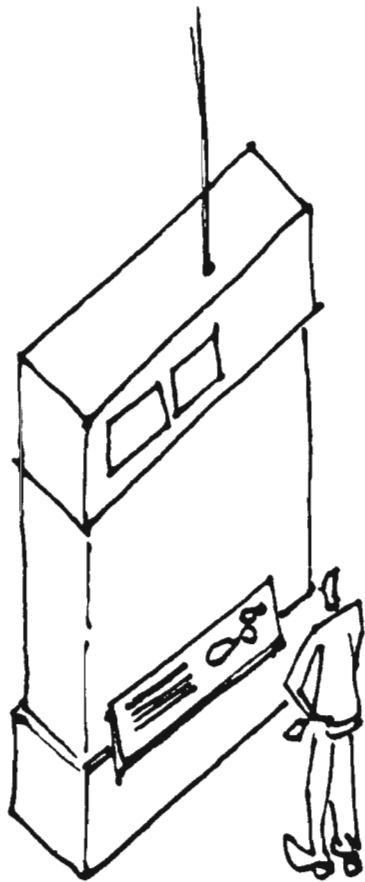
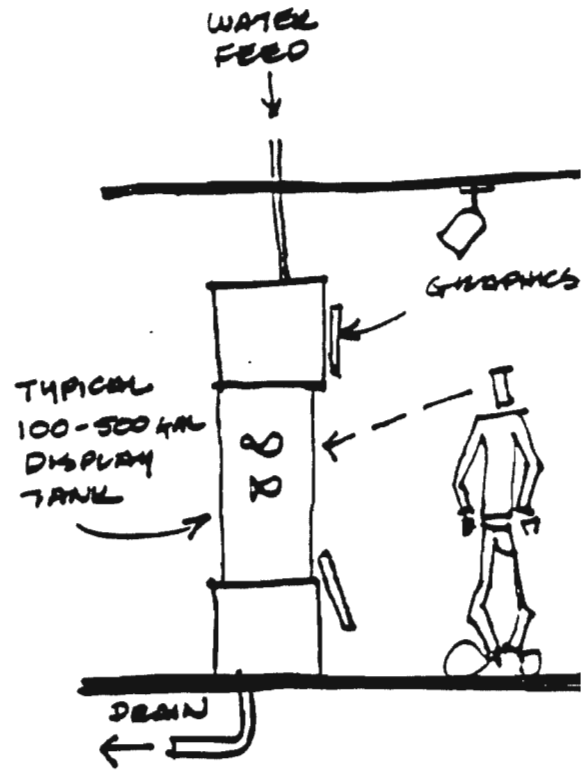


FIGURE 9. SECTION, TYPICAL BURIED WALKWAY



ISOMETRIC



SECTION

FIGURE 10. TYPICAL "PORTRAIT" AQUARIUM

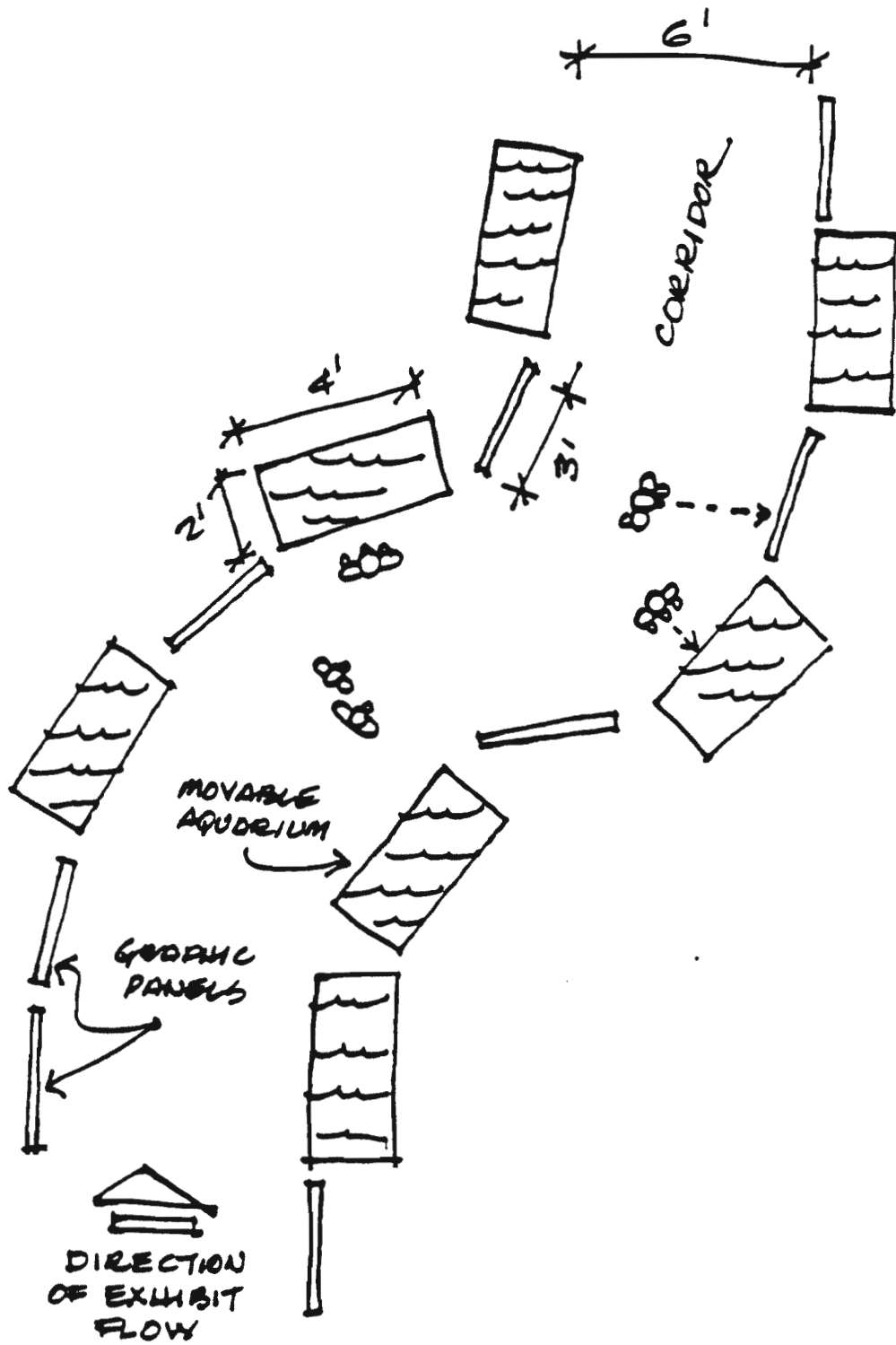


FIGURE 11. ARRANGEMENT OF PORTRAIT AQUARIUMS

OTHER HABITATS

Smaller displays will portray different habitats along the next corridor (see Figure 12).

- o Volcanic boulder - coral community
- o Seagrass bed
- o Marine lakes
- o An elongated flowing freshwater tank depicting the cross-section of a Guam stream will portray the shallow parts of the stream as well as the deep, quiet pools, including local freshwater fish and invertebrates.

REEF AND LAGOON TANK

The largest exhibit in the aquarium will be a tank with a glass-lined "tunnel" so observers can walk through it. In actuality the tunnel is a series of large aquarium tanks rather than one large pool (see Figure 13). A touch-tide pool for handling non-toxic marine animals will border the reef tank. The tank itself will be designed to portray a fringing (or barrier) reef ecosystem, having live stony and soft corals, associated benthic fishes and invertebrates, and aggregations of pelagic fish. Of course, a resident shark will be displayed. The reef tank will overlook the reefs present at the shoreline of the site.

COMPARISON EXHIBIT

A sea snake and a snake eel will be compared in tanks side by side and their anatomies and life cycles will be contrasted as well.

CHILLED SEA WATER

A special tank with recirculating chilled sea water will hold such animals as the chambered nautilus and deepwater shrimp and crabs.

OTHER OUTDOOR EXHIBITS

These will depend upon available space and their ability to be worked into the storyline:

- o A turtle pool
- o Seabird exhibit
- o Mariculture display probably demonstrating prawn rearing

MARINE MAN IN MICRONESIA

The exhibit will depict man's place and role in the water world. In particular, it will interpret the islands of Micronesia and their human inhabitants. Man's use and abuse of the marine resource will be displayed. Senior citizens and others will be invited to participate in "living history" situations where marine-related activities will be described and demonstrated, including net making and throwing, fishing and sea-salt making, and making use of marine products from pre-European to modern times.

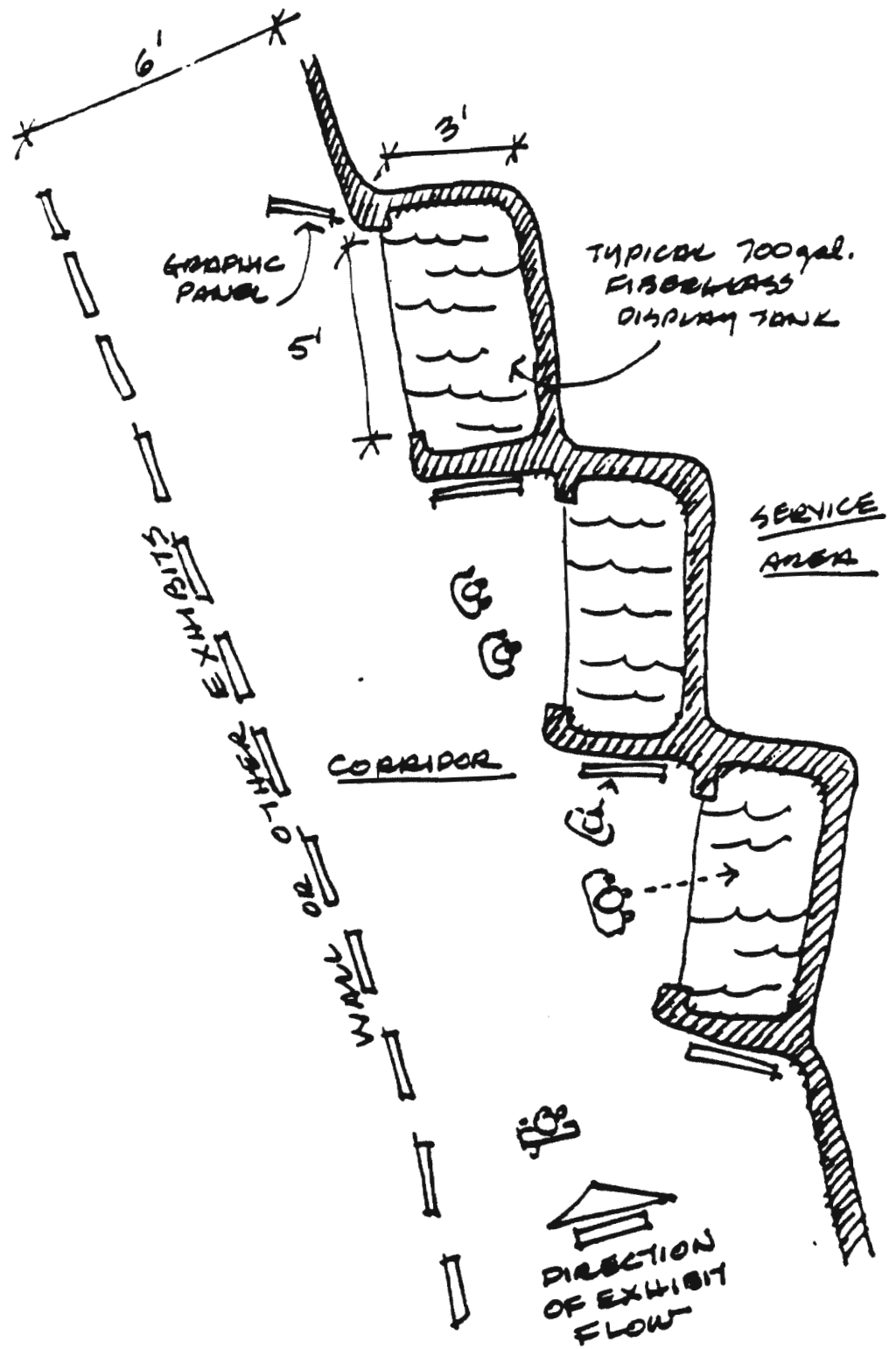


FIGURE 12. PLAN, TYPICAL SMALL HABITAT DISPLAY

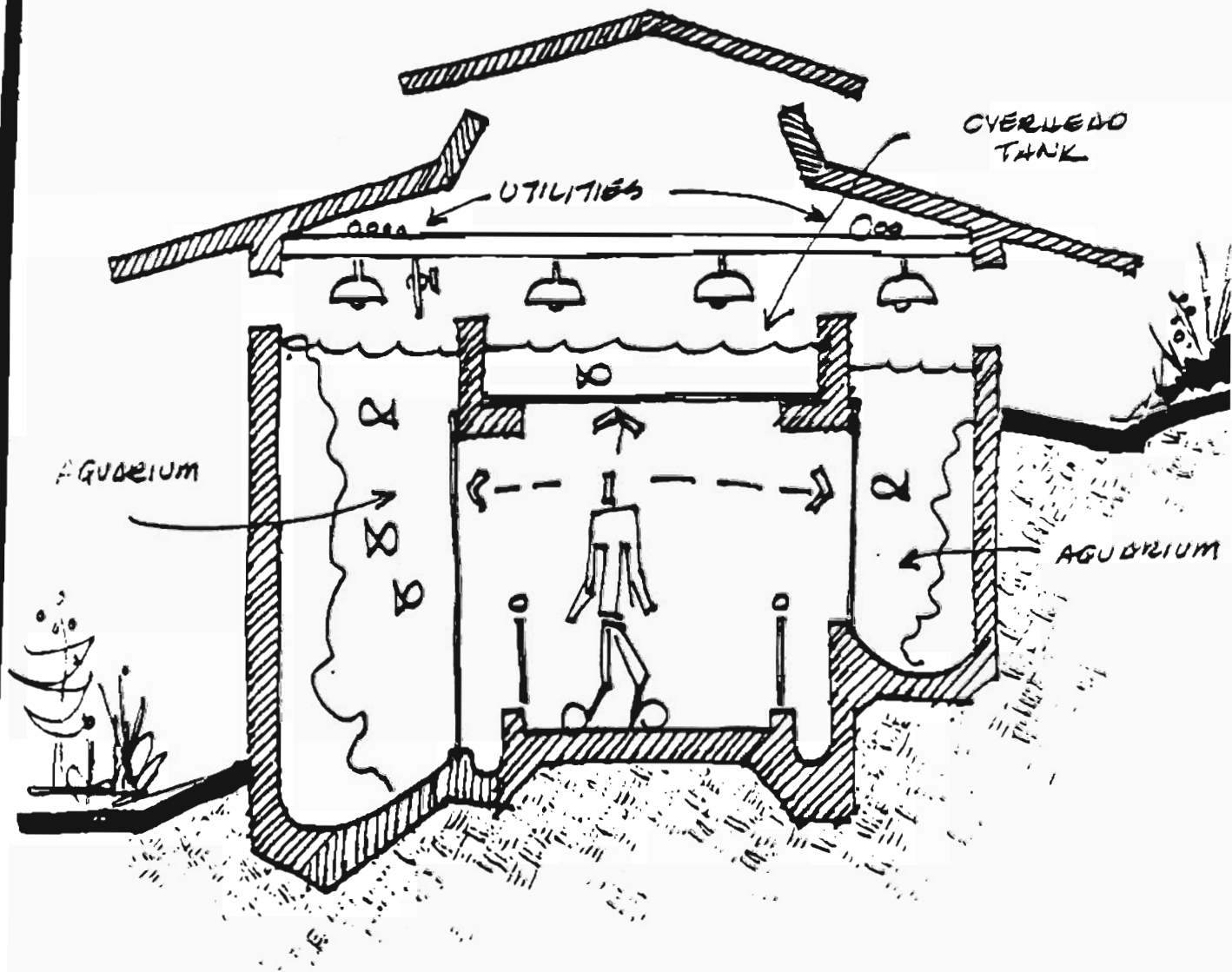


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SOURCE: PLOTTED FROM GUAM VISITORS BUREAU STATISTICS

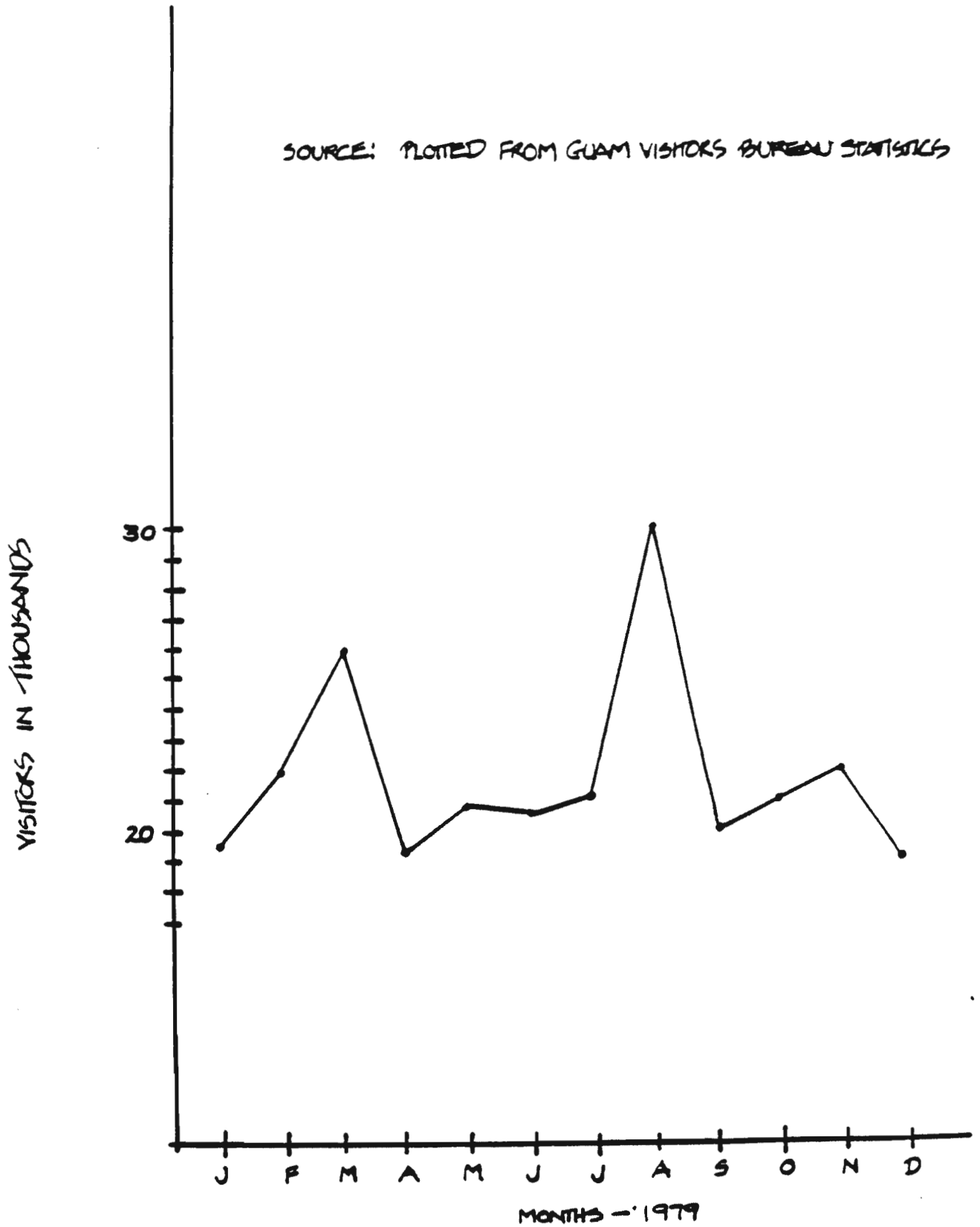


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Only 10 percent of the aquarium's visitors are expected to arrive by car or 20 maximum at any given time. Assuming 1.5 visitors per auto, 20 auto parking spaces should be sufficient. A lot containing 50 auto parking spaces, however, is recommended because experience indicates that one can never have too much parking and insufficient parking is a distinct disadvantage.

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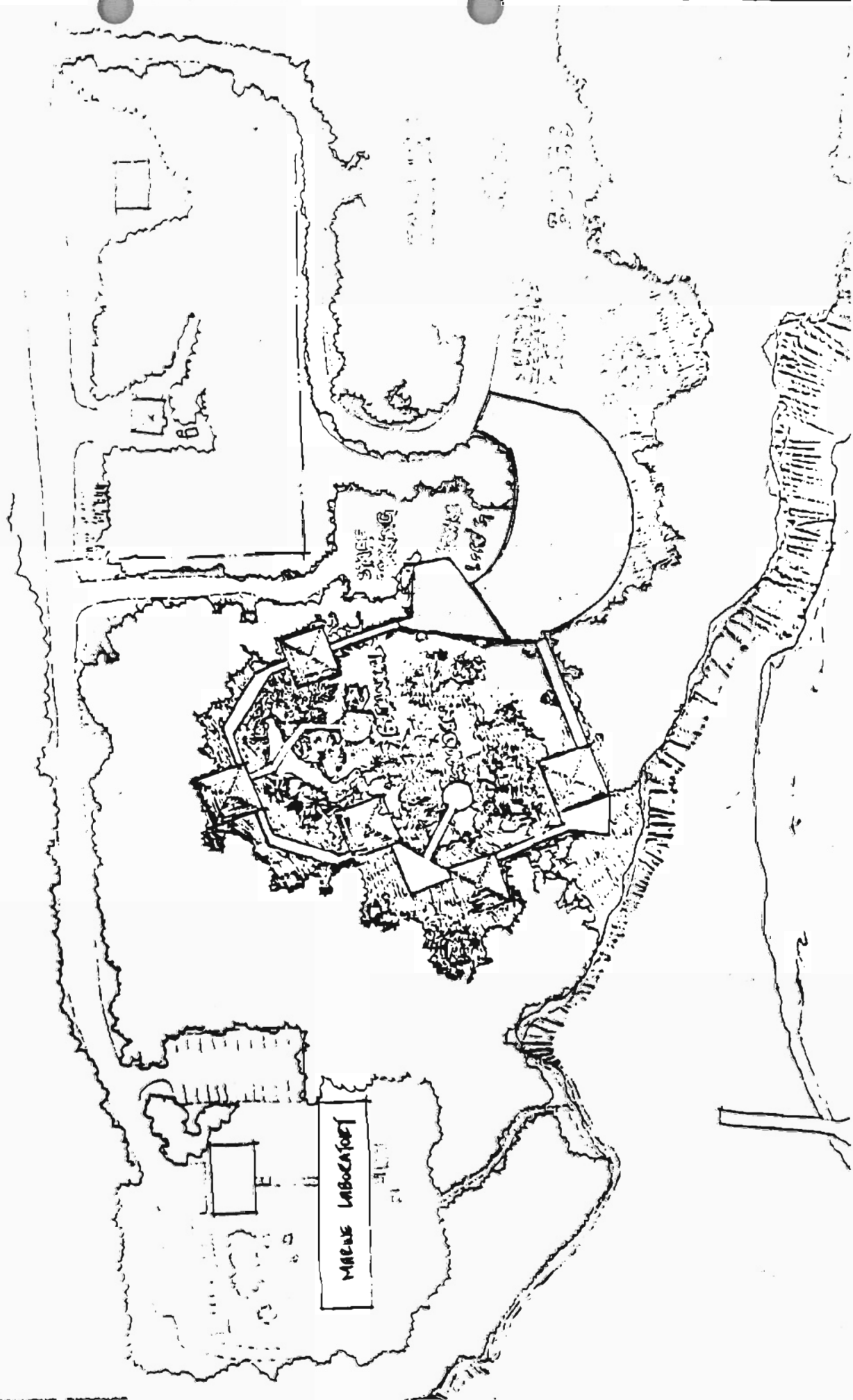
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STUDENT HOUSING

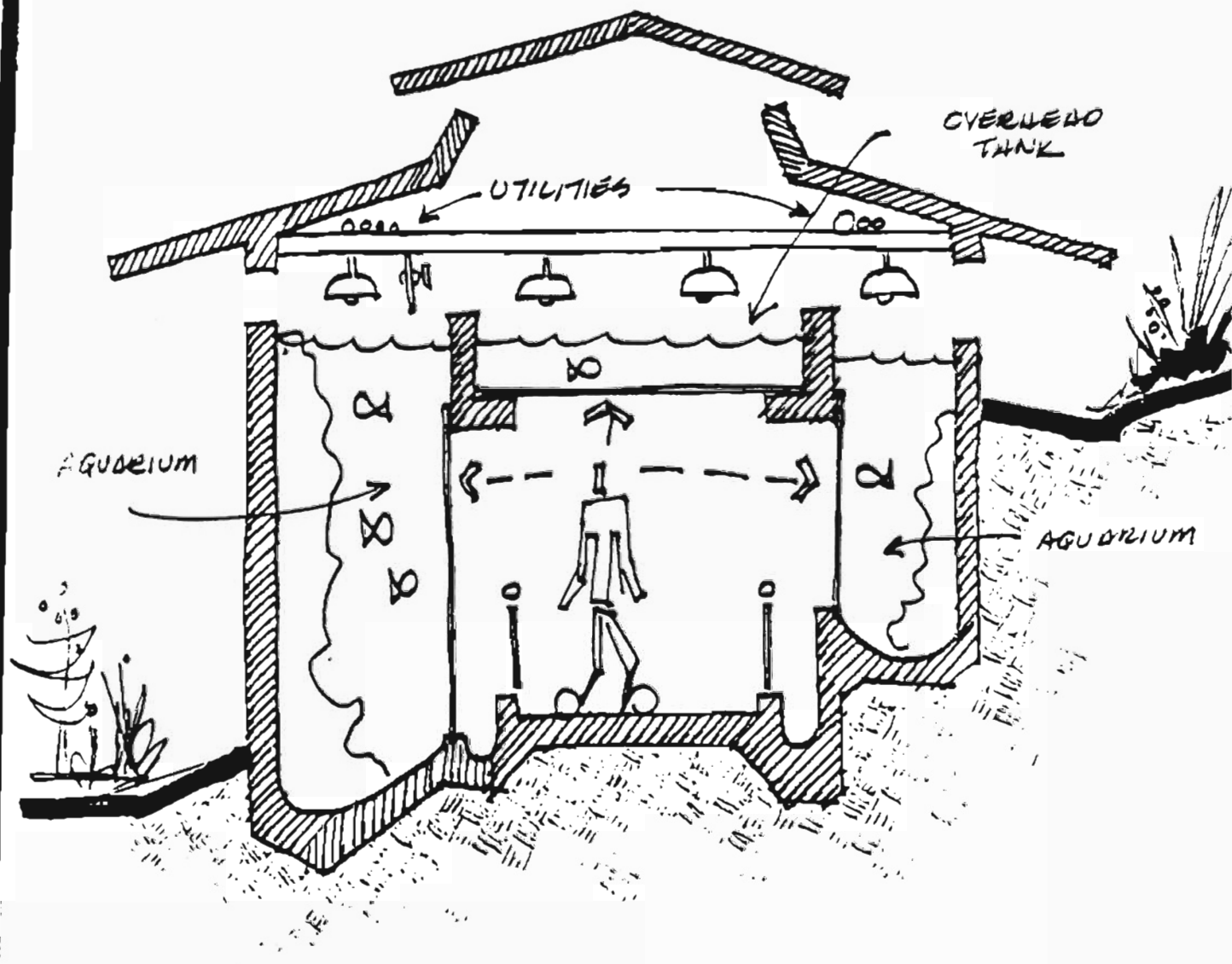


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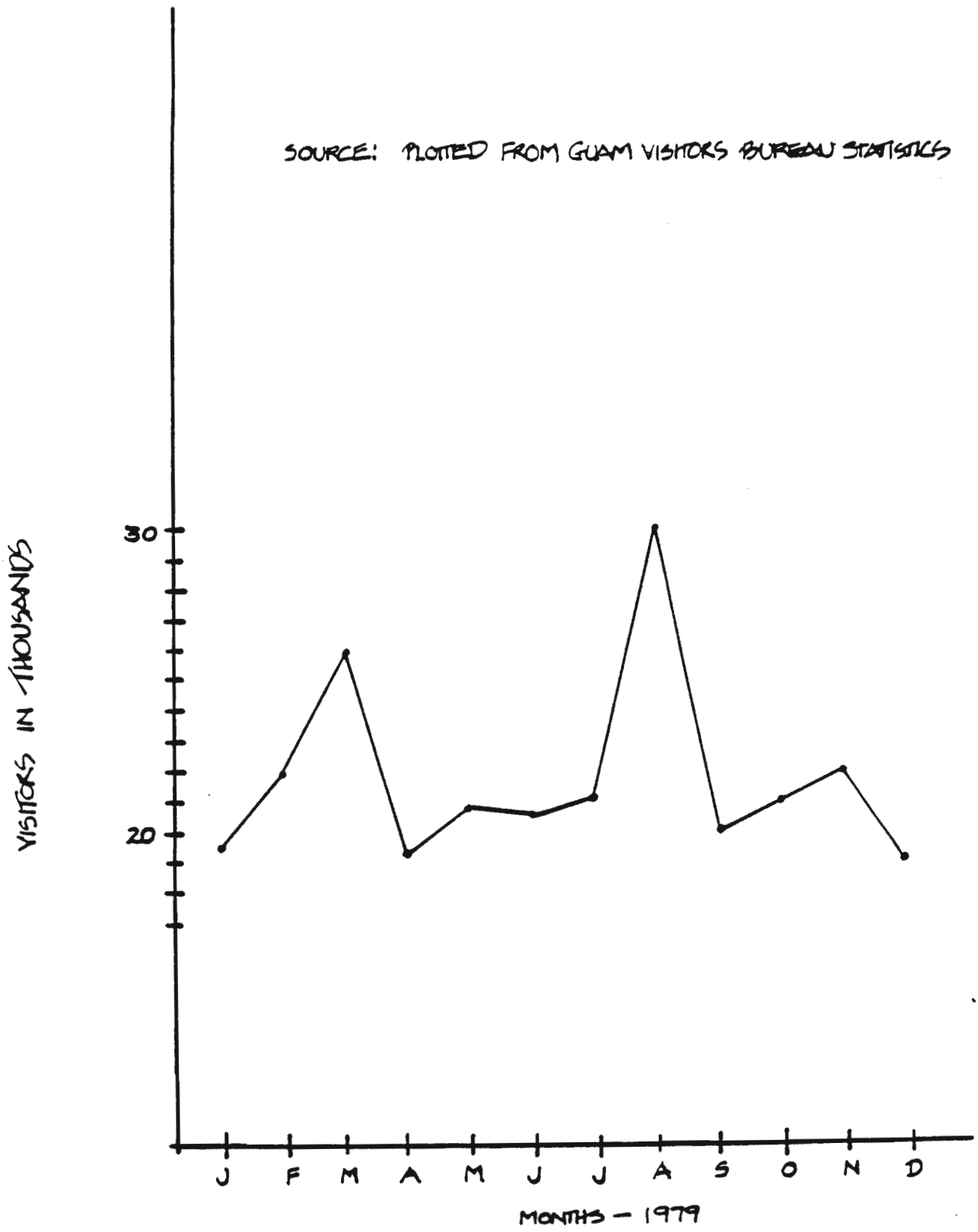


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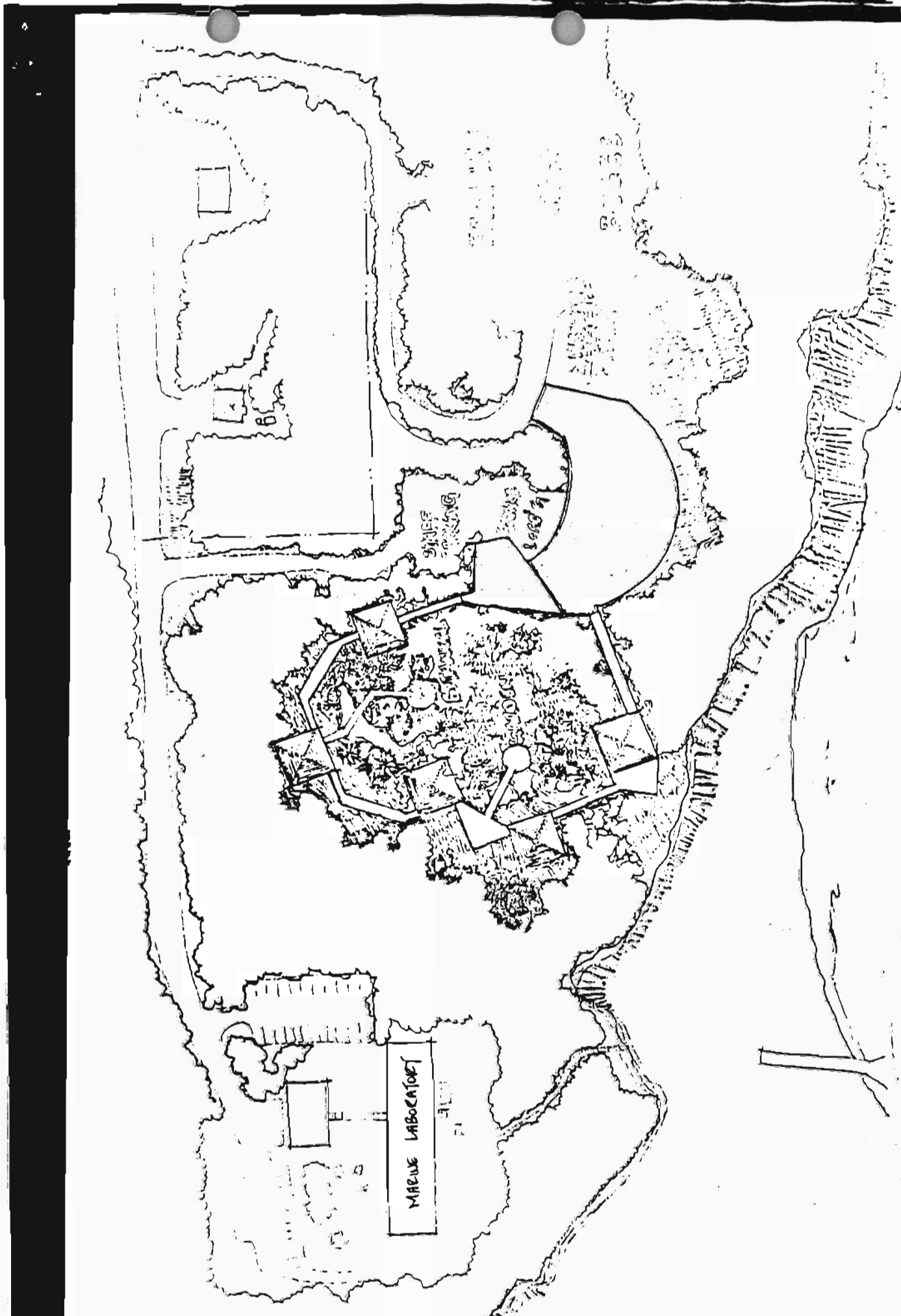
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Maintenance

Guam's climate can be severe to materials not developed for use in the tropics. Soil materials require constant attention to maintain them. Only proven materials will be used such as concrete, certain species of wood, aluminum, and masonry.

Cost

There are a variety of products available which will work very well in solving the problems of compatibility with the site and maintenance. However, because their manufacture is very labor intensive or requires exotic materials such as stainless steel, they are very expensive. These products will be avoided and the money directed towards other elements of the facility where expensive components cannot be avoided.

Performance

Careful attention will be made to select products that are suited for their intended use. Generally, the materials have been used by the architect on previous projects and their performance is known and well documented.

INTERIOR

Interior materials should incorporate the characteristics outlined above plus reflect the space where it is used.

Public spaces should use materials which reinforce the experience afforded the visitors. This is done with texture, color, scale, etc. The entry lobby for example may consist of a light-colored, smooth-textured, monolithic ceiling plane, starting at a wall faced with native stone and soaring out towards the high limestone cliff to the ocean beyond.

The opposite side, facing the ocean, is open. The floor consisting of geometric masonry units which become larger and more irregular as they extend towards the exterior, gradually evolves into the natural stone which is abundant in the natural setting and gives one the feeling that the building is a natural evolution of the environment.

Not all spaces require such a degree of architectural expression, however. Some are more responsive to their particular function. The administrative areas are such spaces. Attention is directed to the space itself rather than its relationship to the exterior environment. An atmosphere conducive to the operation of the facility takes precedent. The temperature and humidity are controlled by air conditioning, the floor is carpeted, and wall textures and colors are selected which do not distract or conflict with the working atmosphere.

All spaces will be designed with the thought and care described above. Architectural design is a creative process of which material selection is only one element.

APPENDIX A

PLANT COMMUNITIES AND TERRESTRIAL ANIMALS

PLANT COMMUNITIES

The Natural Site (Limestone Forest)

Key: A Scientific Name
 B Family Name
 C Common Name
 D Chamorro Name
 E Description

- | | | | | | |
|----|---|--|-----|---|--|
| 1. | A | <u>Guamia mariannae</u> | 9. | A | <u>Macaranga thompsonii</u> |
| | B | Annonaceae | | B | Euphorbiaceae |
| | D | Paipai | | D | Pengua |
| | E | Small, many-branched tree | | E | Small tree with large leaves |
| 2. | A | <u>Neisosperma oppositifolia</u> | 10. | A | <u>Melanolepis multiglandulosa</u> |
| | B | Apocynaceae | | B | Euphorbiaceae |
| | D | Fagot | | D | Alum |
| | E | Medium-sized tree | | E | Small- to medium-sized tree |
| 3. | A | <u>Ochrosia mariannensis</u> | 11. | A | <u>Phyllanthus marianus</u> |
| | B | Apocynaceae | | B | Euphorbiaceae |
| | D | Langiti | | D | Gadgad uchan |
| | E | Small tree | | E | Small, woody shrub |
| 4. | A | <u>Asplenium nidus</u> | 12. | A | <u>Flagellaria indica</u> |
| | B | Aspleniaceae | | B | Flagellariaceae |
| | C | Bird's nest fern | | C | False rattan |
| | D | Galak dangkulo, galak feda | | D | Beyuko halomtano |
| | | | | E | Creeping or climbing vine |
| 5. | A | <u>Cordia subcordata</u> | 13. | A | <u>Mammea odorata</u> |
| | B | Boraginaceae | | B | Guttiferae |
| | D | Niyoron | | D | Chopak |
| | E | Small- to medium-sized tree | | E | Large tree with leathery leaves |
| 6. | A | <u>Maytenus thompsonii</u> | 14. | A | <u>Abrus precatorius</u> |
| | B | Celastraceae | | B | Leguminosae |
| | D | Luluhot | | C | Crab's eye, prayerbead, coral bean |
| | E | Shrub or small tree | | D | Kulales |
| 7. | A | <u>Cycas circinalis</u> | | E | Slender, branching woody, deciduous climber |
| | B | Cycadaceae | | | |
| | C | Federico nut, cycad | 15. | A | <u>Caesalpinia major</u> |
| | D | Fadang | | B | Leguminosae |
| | E | Palm-like, usually unbranched tree with thick trunk | | C | Wait-a-bit |
| 8. | A | <u>Davallia solida</u> | | D | Pakao |
| | B | Davalliaceae | | E | Woody climber |
| | D | Puga machena | | | |
| | E | Common epiphytic fern | | | |

- 34. A Psychotria mariana
B Rubiaceae
D Aplokating
E Small tree
- 35. A Randia cochinchinensis
B Rubiaceae
D Sumak
E Small tree
- 36. A Triphasia trifolia
B Rutaceae
C Limeberry
D Lemondichina, lemonchina
E Shrub
- 37. A Cestrum diurnum
B Solanaceae
C China inkberry
D Tintanchina
E Low growing, many-branched shrub
- 38. A Melochia compacta
B Sterculiaceae
D Sayafe'
E Large shrub
- 39. A Elaeocarpus sphaericus
B Tilaceae
D Yoga
E Large tree
- 40. A Elatostema calcareum
B Urticaceae
D Tapun Akuyu
E Fleshy herb
- 41. A Pipurus argenteus
B Urticaceae
D Amahatyan
E Small tree
- 42. A Procris pendunculata
B Urticaceae
E Fleshy herb
- 43. A Premna obtusifolia
B Verbenaceae
D Ahgao
E Small- to medium-sized tree

- 44. A Vitex parviflora
B Verbenaceae
D Lagundi
E Small tree

Mangrove Swamp

- 1. A Lumnitzera littorea
B Combretaceae
D Nana
E Small, shrubby tree
- 2. A Scirpus littoralis
B Cyperaceae
C Bullrush
E Tall, erect, daric green reed
- 3. A Phragmites karka
B Gramineae
C Reed
D Kariso
E Very tall, jointed grass
- 4. A Sporobolus virginicus
B Gramineae
C Beach grass, salt grass
D Totopot
E Short-stemmed, creeping beach grass
- 5. A Dalbergia candenatensis
B Leguminosae
E Sprawling climber
- 6. A Xylocarpus moluccensis
B Meliaceae
C Cannonball tree
D Lalanyok
E Small tree
- 7. A Acrosticum aureum
B Pteridaceae
D Langayao
E Large, course fern
- 8. A Bruguiera gymnorhiza
B Rhizophoraceae
C Mangrove
D Mangle' machu
E Small tree with numerous prop roots

- 2. C Witchbird; white-tailed tropic bird
E Nests in crevices in the face of rock cliffs
- 3. A Anous stolidus pileatus
C Common noddy tern
E Common along cliffshores
- 4. A Sula leucogaster plotus
C Brown booby; gannet
E Nest on ground

Shorebirds

- 1. A Demigretta sacra sarca
C Reef heron
- 2. A Egretta intermedia intermedia
C Plumed egret
- 3. A Pluvialis dominic fulva
C Pacific golden plover
D Dulili
- 4. A Numenius phaeopus variegatus
C Whimbrel
D Kalalang
- 5. A Heteroscelus brevipes
C Gray-tailed tattler
- 6. A Heteroscelus incanus
C Wandering tattler
- 7. A Limosa lapponica
C Pacific godwit

Landbirds

- 1. A Anas ous aletti
C Marianas mallard
E Nests in reed swamps
- 2. A Ixobrychus sinensis
C Chinese least bittern
D Kakkag
- 3. A Rallus owstoni
C Guam rail

- 4. A Poliolimnas cineris micronesiae
C White-browed rail
E Lives in marsh areas
- 5. A Aplonis opacus guami
C Micronesian starling
- 6. A Coruus kubaryi
C Guam crow
E Found in limestone forest
- 7. A Ptilinopus
C Fruit dove
E Found in limestone forest
- 8. A Gallicolumba xanthonura
C White-throated ground dove
E Found in limestone forest
- 9. A Zosterops conspicillata
C White eyes
- 10. A Halcyon cinnamomina
C King fisher
- 11. A Myiagra oceana freycineta
C Micronesian broadbill
- 12. A Myzonolo cardinalis saffordi
C Cardinal honeyeater
- 13. A Rhipidura rufifrons uraniae
C Rufous - fronted fantail
- 14. A Collocalia inexpectata
C Nest swiftlet
E Limestone cliffs
- 15. A Acrocephalus luxcinia syrinx
C Nightingale reedwarbler
D Gahngot karrig
E Found in reed marshes
- 16. A Gallinula chloropus guami
C Gallinule
D Pulatata
E Found in reed marshes

APPENDIX B

**EARL R. COMBS, INC.
"PROJECTIONS OF VISITORS AND
REVENUES, GUAM AQUARIUM"**

VISITOR PROJECTION

Guam is expected to enjoy continued growth in tourist traffic, but at a very modest rate. This conclusion was derived from a basic analysis of the Japanese market, which is expected to continue as the dominant source of most tourist traffic, as well as a review of external factors which could affect future travel patterns.

For the Japanese market, the premise was made that the principal factors which would affect travel inclinations would be personal disposable income and the exchange rate between the yen and the dollar. Both of these factors are somewhat sensitive to the world economic situation and to energy costs which are definitely affecting travel plans among the populations of the industrialized nations. As energy costs at home increase, they reduce disposable income. The relative ability of nations to manage their energy costs along with other economic inputs is shown, in some degree, by the exchange rates in currencies. So these factors were judged to be quite significant and were selected over purely demographic factors such as population growth, marriages, and others that might have been used.

The consequence of basing the forecast on factors that are more sensitive to current economic conditions is that the projections show modest growth rates. These are probably quite realistic.

Factors which could alter this situation dramatically would develop from major investments in Guam for hotels, expanded utility services, promotion of Guam in other far eastern markets, and more air service from these markets. While this type of tourist expansion scenario may be possible, it seems far less likely than the modest growth expectations used in the baseline forecast presented here. The derivation of the forecast is presented herein.

Promotion of the aquarium in the tourist market should be most effective if it is included in the tour package under which more than 90 percent of the Japanese tourists travel. Their typical stay is 3.5 to 4.0 days which allows adequate time for an aquarium visit. Also, the ticket cost of approximately \$10 paid to the tour operator, of which about \$6 would go to the aquarium and for transportation, would be a modest yet profitable addition to the overall tour cost. Consequently, a high incidence of inclusion of the aquarium in tour packages is forecast.

Two forecasts have been made with the incidence of aquarium visits by visitors being the chief variable. These are shown in Table B.1.

PROJECTIONS OF VISITORS IN GUAM

Visitor Arrivals by Air

Table B.2 shows the number of visitor arrivals in Guam from 1969 to 1979. Figure B.1 shows the number of visitors arriving by air for 1967 to 1979. After Super-typhoon Pamela in 1976, the proportion of Japanese visitors to the total was around 70 percent. The other 30 percent are from the United States, Pacific Trust Territory, and other countries.

TABLE B.2
TOTAL AND JAPANESE VISITORS TO GUAM BY AIR
(1969 to 1979)

| Year | Total Persons | Japanese Persons | % of Total |
|------|------------------|---------------------|------------|
| 1969 | 58,265 | 29,133 | 50.0 |
| 1970 | 73,723 | 44,086 | 59.8 |
| 1971 | 119,174 | 84,018 | 70.5 |
| 1972 | 185,399 | 138,864 | 74.9 |
| 1973 | 241,146 | 164,703 | 68.3 |
| 1974 | 260,568 | 172,235 | 66.1 |
| 1975 | 239,695 | 174,258 | 72.7 |
| 1976 | 201,344 | 139,733 | 69.4 |
| 1977 | 240,467 | 152,456 | 63.4 |
| 1978 | 231,975 | 161,440 | 69.6 |
| 1979 | 264,326 | 190,810 | 72.2 |

Source: Economic Research Center, Department of Commerce, Government of Guam;
 Guam Visitors Bureau

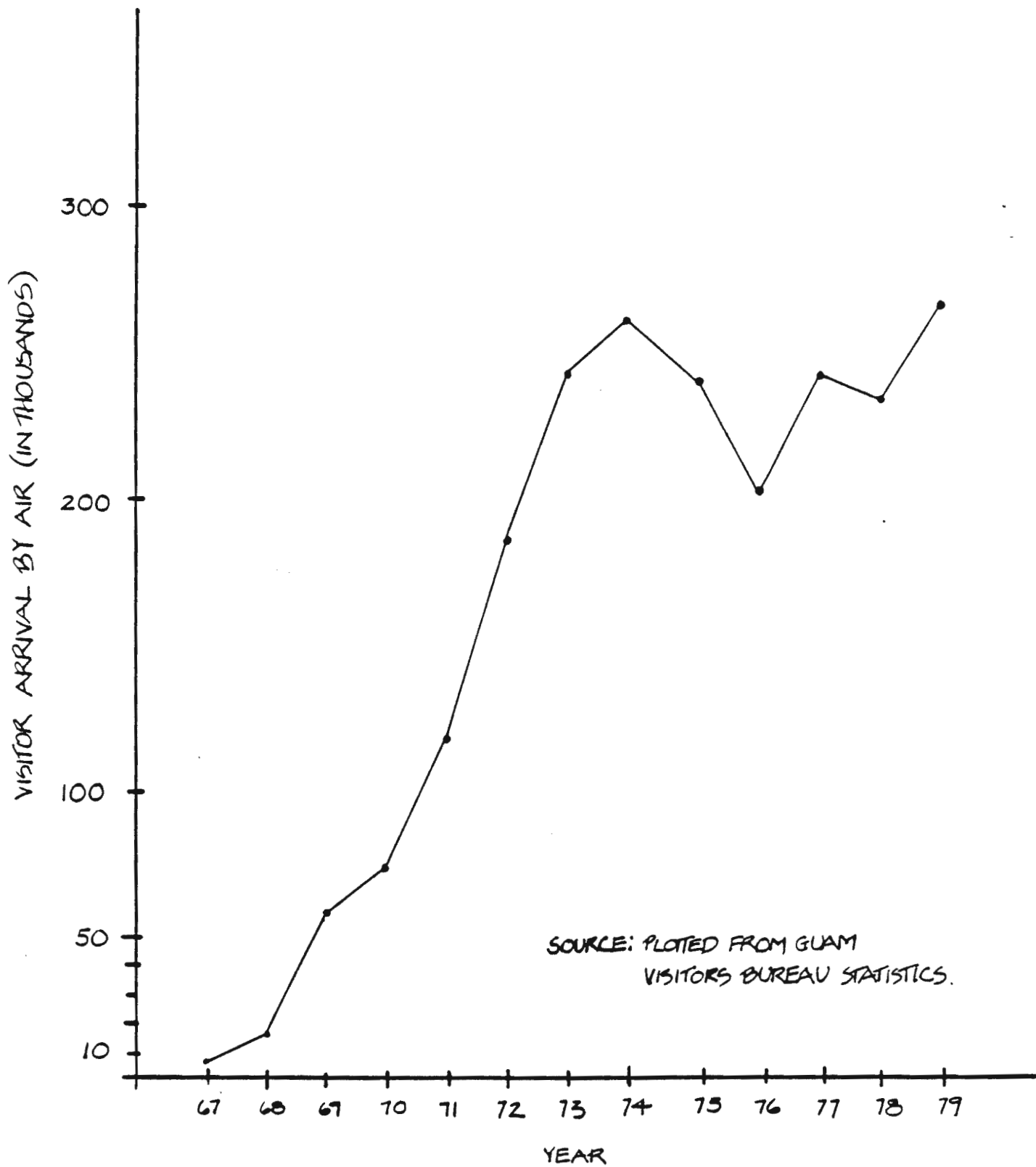


FIGURE B.1. VISITOR ARRIVALS TO GUAM BY AIR

TABLE B.3
ECONOMIC INDICATORS OF JAPAN IN GUAM'S TOURISM

| Year | Japanese ^(a) Visitors in Guam | Japanese ^(b) Per Capita Disposable Income (1,000s yen) | Japanese ^(c) Foreign Exchange Rate (Yen/\$) |
|------|--|---|--|
| 1969 | 29,133 | 446.8 | 357.80 |
| 1970 | 44,086 | 509.6 | 357.65 |
| 1971 | 84,018 | 566.7 | 314.80 |
| 1972 | 138,864 | 648.9 | 302.00 |
| 1973 | 164,703 | 791.9 | 280.00 |
| 1974 | 172,235 | 991.9 | 300.95 |
| 1975 | 174,258 | 1,139.3 | 305.15 |
| 1976 | 139,733 | 1,275.9 | 292.80 |
| 1977 | 152,456 | 1,399.2 | 241.05 |
| 1978 | 161,440 | 1,509.9 | 194.60 |
| 1979 | 190,810 | 1,628.4 | 239.70 |

Source: a. Economic Research Center, Department of Commerce, Government of Guam; Guam Visitors Bureau.

b. Derived from EPA. Annual Report on National Accounts, Central Bank of Tokyo; in OECD Economic Surveys, Japan. July 1979.

c. International Financial Statistics, International Monetary Fund, various issues; Statistical Survey of Japan's Economy, Economic and Foreign Affairs Research Association, Japan, 1978 and 1979.

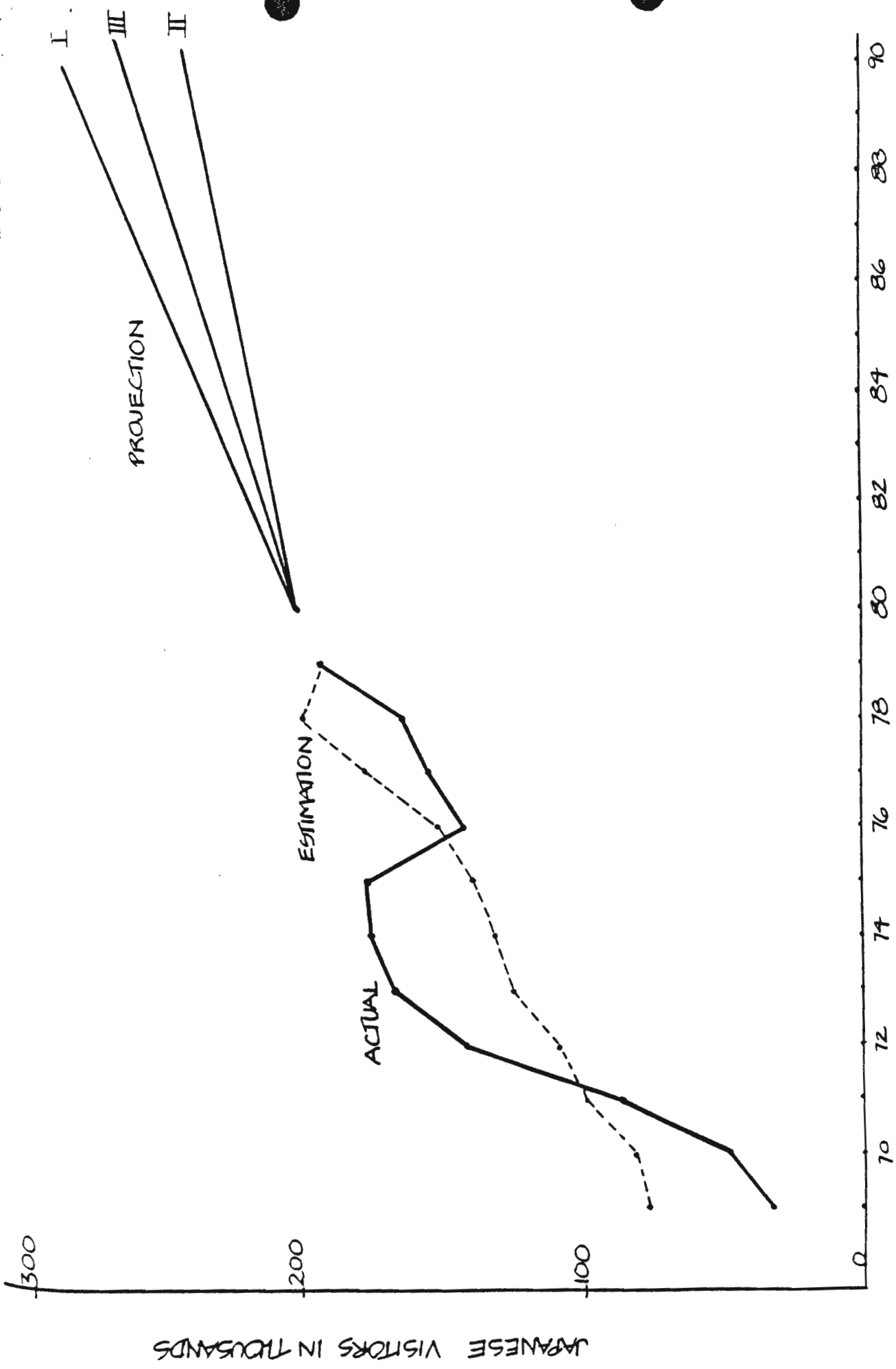


FIGURE B.2. PROJECTIONS OF JAPANESE VISITORS BY AIR IN GUAM

TABLE B.4
PROJECTIONS OF JAPANESE VISITORS IN GUAM BY AIR
(1980 to 1990)

| Year | Assumption ^(a) I | Assumption ^(b) II | Assumption ^(c) III |
|------|--------------------------------|---------------------------------|----------------------------------|
| 1980 | 200,007 | 199,009 | 199,508 |
| 1981 | 204,029 | 207,424 | 205,727 |
| 1982 | 208,045 | 215,832 | 211,939 |
| 1983 | 212,070 | 224,247 | 218,159 |
| 1984 | 216,085 | 232,655 | 224,370 |
| 1985 | 220,107 | 241,069 | 230,588 |
| 1986 | 224,123 | 249,477 | 236,800 |
| 1987 | 228,148 | 257,892 | 243,020 |
| 1988 | 232,164 | 266,300 | 249,232 |
| 1989 | 236,186 | 274,714 | 255,450 |
| 1990 | 240,201 | 283,122 | 261,662 |

- a. Low-range estimates. Reverse trend in foreign exchange market was assumed.
- b. High-range estimates. 1979 foreign exchange rate was assumed to be constant.
- c. Mid-range estimates.

TABLE B.8
PROJECTIONS OF TOTAL VISITORS IN GUAM
BY MEANS OF TRANSPORTATION
(1980 to 1990)

| <u>Year</u> | <u>Air</u> | <u>Ship</u> | <u>Total</u> |
|-------------|------------|-------------|--------------|
| 1980 | 285,011 | 9,009 | 294,020 |
| 1981 | 293,896 | 9,290 | 303,186 |
| 1982 | 302,770 | 9,571 | 312,341 |
| 1983 | 311,656 | 9,851 | 321,507 |
| 1984 | 320,529 | 10,132 | 330,661 |
| 1985 | 329,411 | 10,413 | 339,824 |
| 1986 | 338,286 | 10,693 | 348,979 |
| 1987 | 347,171 | 10,974 | 358,145 |
| 1988 | 356,046 | 11,255 | 367,301 |
| 1989 | 364,929 | 11,535 | 376,464 |
| 1990 | 373,803 | 11,815 | 385,618 |

AQUARIUM VISITORS
ASSUMPTION NO. 1

A. TOURIST

| | Package 90% | Pleasure Other 70% | Total | Business 30% | Other Purpose 50% | Total Visitors by Air | Visitors by Ship 50% | Grand Total | Revenue @ \$5.00 |
|------|----------------|--------------------------|---------|-----------------|----------------------|-----------------------------|----------------------------|----------------|------------------------|
| 1980 | 172,375 | 30,923 | 203,298 | 8,550 | 10,403 | 222,251 | 4,505 | 226,756 | \$1.13 million |
| 81 | 177,748 | 31,888 | 209,636 | 8,817 | 10,728 | 229,181 | 4,645 | 233,826 | 1.17 million |
| 82 | 183,115 | 32,852 | 215,967 | 9,083 | 11,051 | 236,101 | 4,786 | 240,887 | 1.20 million |
| 83 | 188,490 | 33,814 | 222,304 | 9,350 | 11,376 | 243,030 | 4,926 | 247,956 | 1.24 million |
| 84 | 193,856 | 34,777 | 228,633 | 9,616 | 11,670 | 249,919 | 5,066 | 254,985 | 1.27 million |
| 85 | 199,228 | 35,741 | 234,969 | 9,882 | 12,024 | 256,875 | 5,207 | 262,082 | 1.31 million |
| 86 | 204,595 | 36,704 | 241,299 | 10,149 | 12,348 | 263,796 | 5,347 | 269,143 | 1.35 million |
| 87 | 209,969 | 37,668 | 247,637 | 10,415 | 12,672 | 270,724 | 5,487 | 276,211 | 1.38 million |
| 88 | 215,337 | 38,632 | 253,969 | 10,681 | 12,996 | 277,646 | 5,628 | 283,274 | 1.42 million |
| 89 | 220,709 | 39,594 | 260,303 | 10,948 | 13,320 | 284,571 | 5,768 | 290,339 | 1.45 million |
| 90 | 226,076 | 40,557 | 266,633 | 11,214 | 13,644 | 291,491 | 5,908 | 297,399 | 1.49 million |

B. GUAMANIANIS

| | No. Adult | No. Children | No. Total | Revenue | | Total Revenue | Grand Total Revenue |
|------|-----------|--------------|-----------|-------------------|----------------------|------------------|---------------------------|
| | | | | Adult @ \$4.00 | Children @ \$2.00 | | |
| 1980 | 10,610 | 7,074 | 17,684 | \$43,440 | \$14,148 | \$56,588 | \$1.19 million |
| 81 | 11,035 | 7,357 | 18,392 | 44,140 | 14,714 | 58,854 | 1.23 million |
| 82 | 11,476 | 7,651 | 19,127 | 45,904 | 15,302 | 61,206 | 1.26 million |
| 83 | 11,935 | 7,957 | 19,892 | 47,740 | 15,914 | 63,654 | 1.30 million |
| 84 | 12,413 | 8,275 | 20,688 | 49,652 | 16,650 | 66,202 | 1.34 million |
| 85 | 12,909 | 8,606 | 21,515 | 51,636 | 17,212 | 68,848 | 1.38 million |
| 86 | 13,426 | 8,950 | 22,376 | 53,704 | 17,900 | 71,604 | 1.42 million |
| 87 | 13,963 | 9,308 | 23,271 | 55,852 | 18,616 | 74,468 | 1.45 million |
| 88 | 14,521 | 9,681 | 24,202 | 58,284 | 19,362 | 77,446 | 1.49 million |
| 89 | 15,102 | 10,068 | 25,170 | 60,408 | 20,136 | 80,544 | 1.53 million |
| 90 | 15,706 | 10,471 | 26,177 | 62,824 | 20,942 | 83,766 | 1.57 million |

OPERATING REVENUES AND COSTS

Using the visitor figures shown (See Table B.1) and a pricing rate of \$5.00 per person for visitors, \$4.00 per person for adult residents of Guam, and \$2.00 for children, revenues are projected in Table B.8 for alternatives as shown.

Based on data from the Seattle Aquarium and the referenced study for an aquarium proposed in Honolulu, a reasonable estimate, using Guam labor rates for operating and maintenance costs would appear to be \$26 per square foot per year. At the proposed size of 40,000 square feet, the operating and maintenance expense would be \$1,040,000 per year. As shown in Table B.8, this is below the revenue projections for either alternative in all of the years.

It does not, however, create a project surplus that would be at all meaningful in relation to a capital amortization program. As an example, even if the facility at a total cost of \$10,400,000 is provided at 50 percent grant with the other 50 percent to be paid off over a 25-year period with 8 percent tax-free revenue bonds, the annual payment would be \$481,700 per year. This is considerably more than the surplus projected at the \$5/person nominal entrance fee for the first several years of aquarium operation. Payout at this level should be possible from operations after 1990.

Revenues from concessions have not been given major consideration in this analysis because they are not regarded as a significant factor and could be considered a contingency. A gift shop lease of 900 square feet at \$15 per square foot would generate \$13,500 of revenue with possibly another \$3,000 or \$4,000 revenue percentage income. A restaurant with 2,000 square feet at \$12 per square foot would generate \$24,000/year base income with possibly \$8,000 to \$10,000 of revenue income. The total might reach \$50,000 per year, enough to cover about 5 percent of operating and maintenance costs.

APPENDIX C

**PAUL C. SORENSEN
ECONOMICS OF THE GUAM AQUARIUM**

PAUL C. SORENSEN
ECONOMICS OF THE GUAM AQUARIUM

The analysis presented below attempts to assess the profitability of building an aquarium in Guam. First, the residential population is analyzed and a future growth trend estimated. Secondly, the tourist traffic in Guam is evaluated and projected into the future. Finally, using assumptions about participation rates and pricing schemes, projected revenue is estimated. These figures are compared with estimated costs of construction and operations/maintenance in order to assess profitability. It must be pointed out that projections into the future such as these are extremely sensitive to exogenous changes. Time trends are used to estimate future aquarium usage because errors in measurement are minimized as compared with more elaborate and complicated econometric schemes.

Our most likely forecast estimates positive net revenue to be possible around 1990.

CIVILIAN AND RESIDENT POPULATIONS IN GUAM

The resident population of Guam consists of civilians and members of the Armed Forces. Presently, there are around 10,000 military personnel on the island with dependents numbering 15,300. As Table C.1 indicates, the military has had a fairly constant historical presence, and sources at the Department of Defense assert that this will continue into the future. Indeed, the Department of Defense is a major land user and employer on Guam which serves as the major United States Naval and Air Force site in the Western Pacific. Military activities include logistics, training, weather, communications, and surveillance.

Examination of the historical growth rate of the residential population reveals a 2 percent annual rate from 1950 to 1976. (More recent population data was not available.) This long-term historical growth rate best describes the future and hence is used in projecting future resident population. See Table C.1 and Figure C.1.

Different admission prices have been suggested for children (under the age of 15) and adults. Hence, the projected population needs to be divided further. Census figures in 1970 indicate that 40 percent of the resident population was under 15. This figure was implemented when separating adults and children from total population. See Table C.2.

Aquarium usage in major United States cities (Seattle, Honolulu, etc.) indicates around a 15 percent participation rate among resident populations. This figure depends heavily upon other recreational substitutes available. Since Guam has fewer substitutes, this figure was deemed too low, and participation rates of 20 percent (low) and 40 percent (high) are anticipated. See Table C.3.

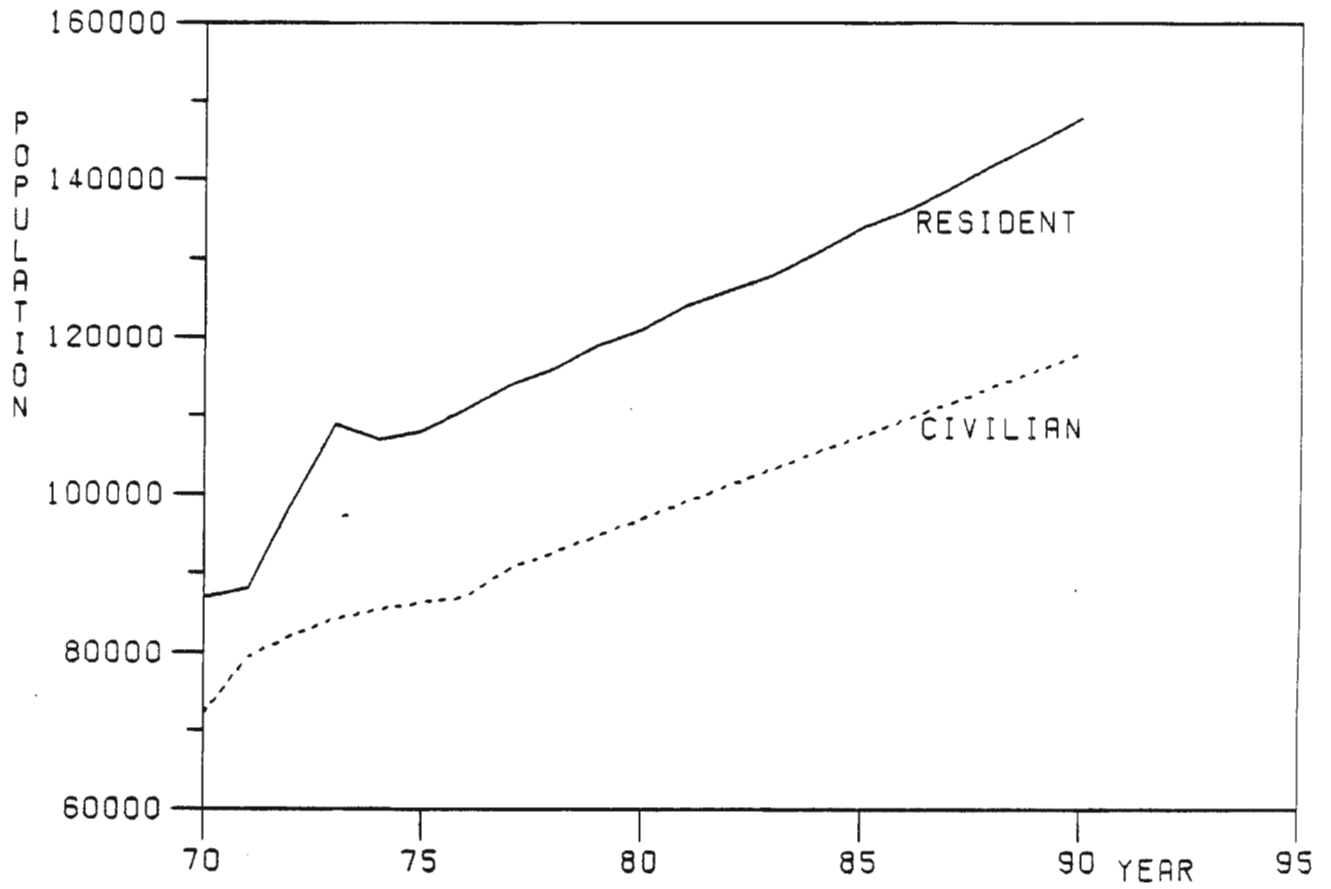


FIGURE C.1. PROJECTED RESIDENT GUAMANIAN POPULATION

TABLE C.2
 PROJECTIONS OF RESIDENT POPULATIONS
 (in thousands)

| <u>Year</u> | <u>Total</u> | <u>Adults</u> | <u>Children</u> |
|-------------|--------------|---------------|-----------------|
| 1984 | 131 | 89 | 42 |
| 1985 | 134 | 91 | 43 |
| 1986 | 136 | 92 | 44 |
| 1987 | 139 | 94 | 45 |
| 1988 | 142 | 96 | 46 |
| 1989 | 145 | 98 | 47 |
| 1990 | 148 | 100 | 48 |

TABLE C.3
 PROJECTED AQUARIUM USAGE BY GUAMANIAN
 (in thousands)

A) Low (20%) participation rate

| <u>Year</u> | <u>Adults</u> | <u>Children</u> | <u>Total</u> |
|-------------|---------------|-----------------|--------------|
| 1984 | 17.8 | 8.4 | 26.2 |
| 1985 | 18.2 | 8.6 | 26.8 |
| 1986 | 18.4 | 8.8 | 27.2 |
| 1987 | 18.8 | 9.0 | 27.8 |
| 1988 | 19.2 | 9.2 | 28.4 |
| 1989 | 19.6 | 9.4 | 29.0 |
| 1990 | 20.0 | 9.6 | 29.6 |

B) High (40%) participation rate

| <u>Year</u> | <u>Adults</u> | <u>Children</u> | <u>Total</u> |
|-------------|---------------|-----------------|--------------|
| 1984 | 35.6 | 16.8 | 52.4 |
| 1985 | 36.4 | 17.2 | 53.6 |
| 1986 | 36.8 | 17.6 | 54.4 |
| 1987 | 37.6 | 18.0 | 55.6 |
| 1988 | 38.4 | 18.4 | 56.8 |
| 1989 | 39.2 | 18.8 | 58.0 |
| 1990 | 40.0 | 19.2 | 59.2 |

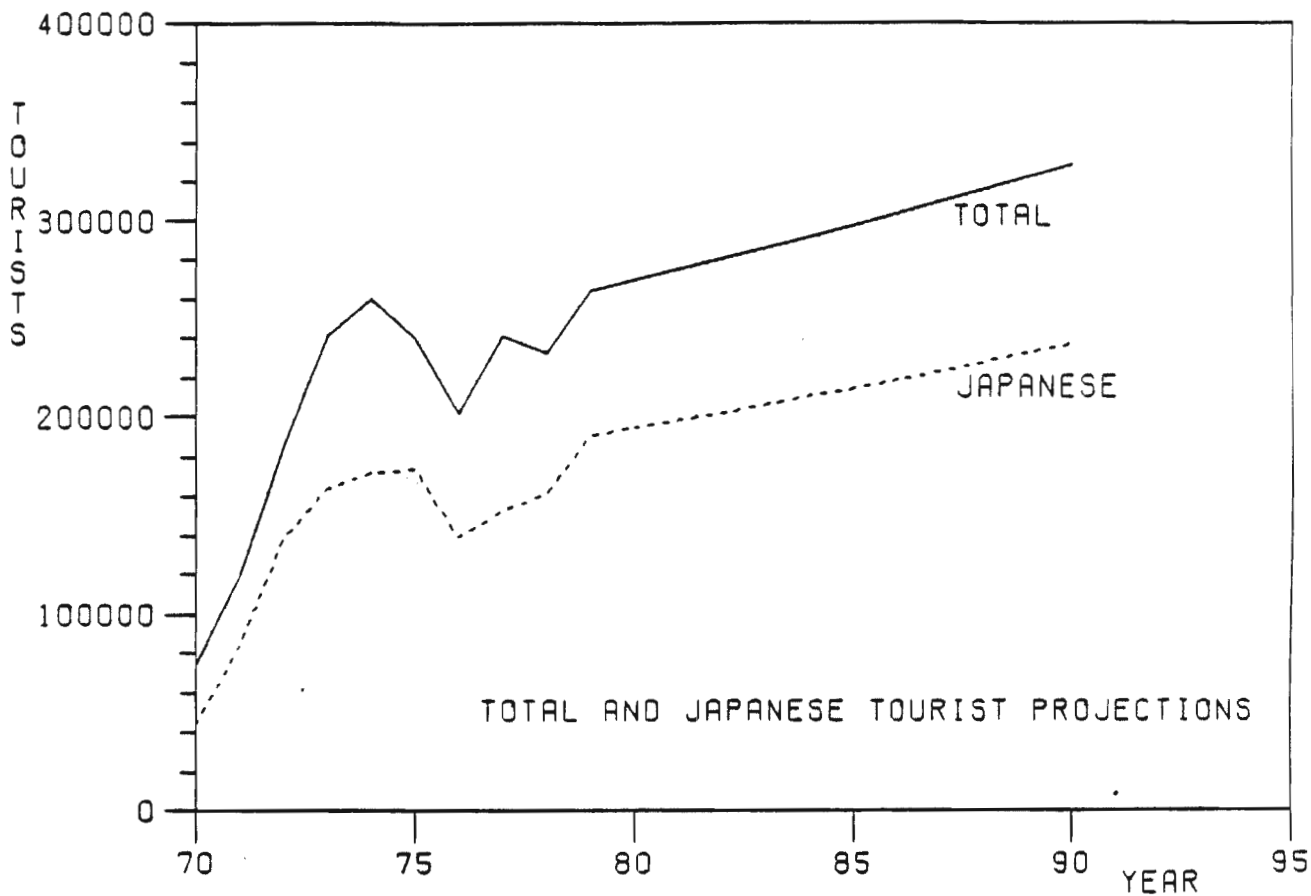


FIGURE C.2. PROJECTED TOURISTS TO GUAM

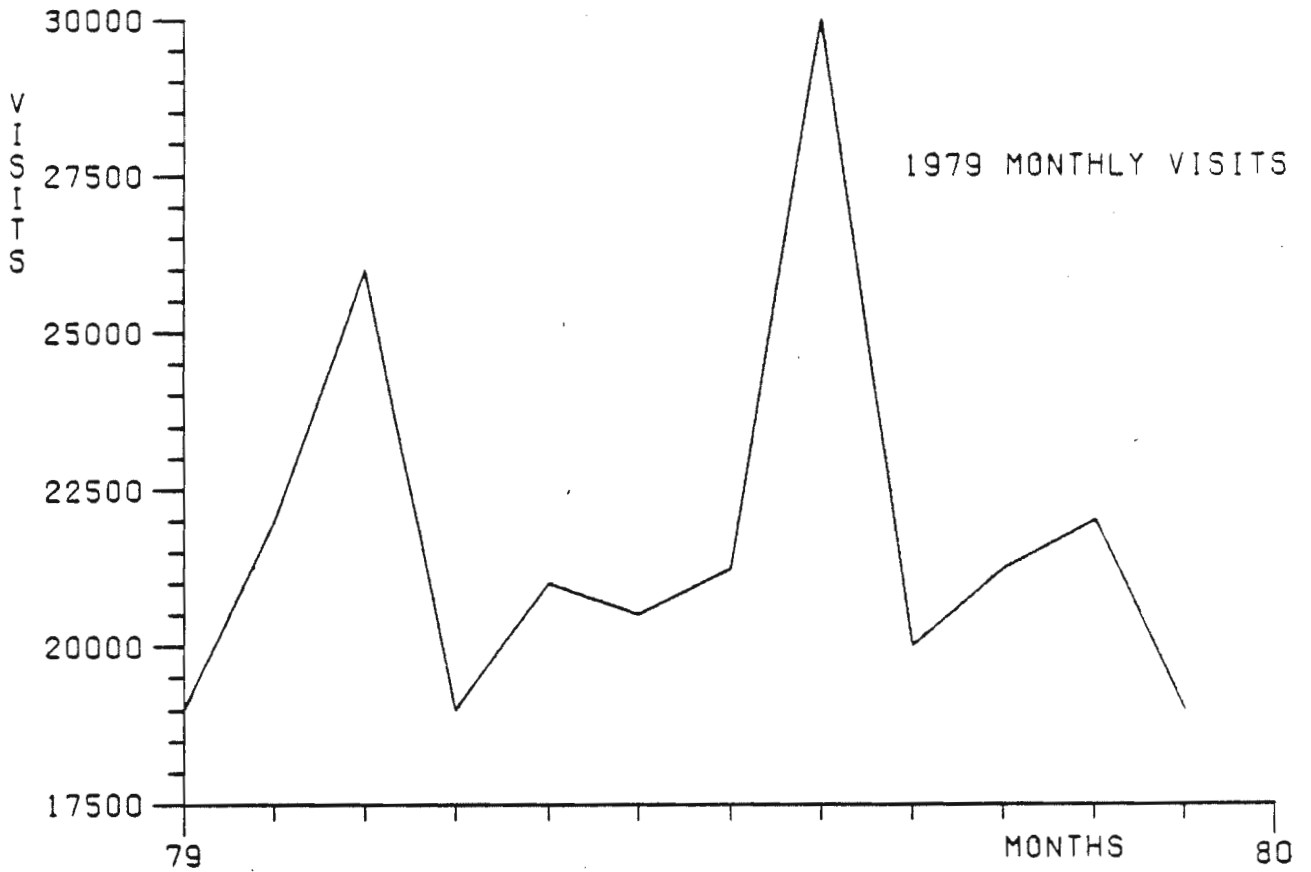


FIGURE C.3. 1979 MONTHLY TOURIST VISITS TO GUAM

TABLE C.4
TOTAL AND JAPANESE VISITORS IN GUAM BY AIR
1969 - 1979

| <u>Year</u> | Total | Japanese | |
|-------------|---------------|---------------|-------------------|
| | <u>Person</u> | <u>Person</u> | <u>% of Total</u> |
| 1969 | 58.265 | 29.133 | 50.0 |
| 1970 | 73.723 | 44.086 | 59.8 |
| 1971 | 119.174 | 84.018 | 70.5 |
| 1972 | 185.399 | 138.864 | 74.9 |
| 1973 | 241.146 | 164.703 | 68.3 |
| 1974 | 260.568 | 172.235 | 66.1 |
| 1975 | 239.695 | 174.258 | 72.7 |
| 1976 | 201.344 | 139.733 | 69.4 |
| 1977 | 240.467 | 152.456 | 63.4 |
| 1978 | 231.975 | 161.440 | 69.6 |
| 1979 | 264.326 | 190.810 | 72.2 |

Average = 67%

Source: Economic Research Center, Department of Commerce, Government of Guam; Guam Visitors Bureau.

TABLE C.5
PROJECTED TOURIST DEMAND IN GUAM
(2% annual rate)

| <u>Year</u> | <u>Japanese</u> | <u>Non-Japanese</u> | <u>Total</u> |
|-------------|-----------------|---------------------|--------------|
| 1984 | 210,670 | 81,130 | 291,800 |
| 1985 | 214,800 | 82,800 | 297,600 |
| 1986 | 219,000 | 84,600 | 303,600 |
| 1987 | 223,500 | 86,200 | 309,700 |
| 1988 | 228,000 | 87,900 | 315,900 |
| 1989 | 232,500 | 89,700 | 322,200 |
| 1990 | 237,200 | 91,400 | 328,600 |

TABLE C.6
PROJECTED VISITOR DEMAND FOR PLEASURE TOURS

| <u>Year</u> | <u>Japanese On Tour</u> | <u>Non-Japanese On Pleasure Tour</u> | <u>Total</u> |
|-------------|-----------------------------|--|--------------|
| 1984 | 206,400 | 38,100 | 244,500 |
| 1985 | 210,500 | 38,900 | 249,400 |
| 1986 | 214,600 | 39,700 | 254,300 |
| 1987 | 219,000 | 40,500 | 259,500 |
| 1988 | 223,400 | 41,300 | 264,700 |
| 1989 | 227,900 | 42,100 | 270,000 |
| 1990 | 232,400 | 42,900 | 275,300 |

TABLE C.3
PROJECTED BUSINESS VISITATION

| <u>Year</u> | <u>Non-Japanese</u> ^(a) | <u>Japanese</u> ^(b) | <u>Total</u> |
|-------------|------------------------------------|--------------------------------|--------------|
| 1984 | 11,800 | 2,100 | 13,900 |
| 1985 | 12,100 | 2,140 | 14,240 |
| 1986 | 12,300 | 2,190 | 14,490 |
| 1987 | 12,500 | 2,230 | 14,730 |
| 1988 | 12,800 | 2,280 | 15,080 |
| 1989 | 13,000 | 2,320 | 15,320 |
| 1990 | 13,300 | 2,370 | 15,670 |

PROJECTED AQUARIUM USAGE

| <u>Year</u> | <u>High (30%)</u> | <u>Low (20%)</u> |
|-------------|-------------------|------------------|
| 1984 | 4,170 | 2,780 |
| 1985 | 4,270 | 2,850 |
| 1986 | 4,340 | 2,900 |
| 1987 | 4,420 | 2,950 |
| 1988 | 4,520 | 3,010 |
| 1989 | 4,590 | 3,060 |
| 1990 | 4,700 | 3,130 |

a. 31%

b. 1%

TABLE C.10
TOTAL ESTIMATED AQUARIUM USAGE

High Estimate

| <u>Year</u> | <u>Guamanians (40%)</u> | <u>Tourist^(a)</u> | <u>Total</u> |
|-------------|-------------------------|------------------------------|--------------|
| 1984 | 52,400 | 221,120 | 273,520 |
| 1985 | 53,600 | 225,540 | 279,140 |
| 1986 | 54,400 | 229,940 | 284,340 |
| 1987 | 55,600 | 234,620 | 290,220 |
| 1988 | 56,800 | 239,260 | 296,060 |
| 1989 | 58,000 | 244,050 | 302,050 |
| 1990 | 59,200 | 248,900 | 308,100 |

Low Estimate

| <u>Year</u> | <u>Guamanians (20%)</u> | <u>Tourist^(a)</u> | <u>Total</u> |
|-------------|-------------------------|------------------------------|--------------|
| 1984 | 26,200 | 194,000 | 220,200 |
| 1985 | 26,800 | 197,870 | 224,670 |
| 1986 | 27,200 | 201,720 | 228,920 |
| 1987 | 27,800 | 205,860 | 233,660 |
| 1988 | 28,400 | 210,020 | 238,420 |
| 1989 | 29,000 | 214,160 | 243,160 |
| 1990 | 29,600 | 218,380 | 247,980 |

a. Japanese on tour

| | <u>High</u> | <u>Low</u> |
|---------------------------------|-------------|------------|
| On pleasure | 90% | 80% |
| Pleasure visitors - not on tour | 70% | 60% |
| Businessmen | 30% | 20% |
| Others | 50% | 40% |

Status of University of Guam Aquarium Planning Program
November 1982, L.G. Eldredge, UOG Marine Laboratory

Members of the Board of Regents met informally at the Marine Laboratory during the early winter of 1977. At that meeting Regent Pedro P. Ada suggested that the Marine Laboratory investigate the possibility of establishing a Public aquarium. Following that meeting Dr. L.G. Eldredge was appointed coordinator to plan a theme statement. In late April 1978, Dr. Eldredge was in Hawaii attending a meeting and travelled to the west coast to visit and met with the directors of the Scripps Aquarium and Sea World in San Diego, Steinhart Aquarium in San Francisco, the new Seattle Aquarium, and Vancouver Aquarium. In Hawaii Dr. Eldredge also met with the directors of the Waikiki Aquarium and Sea Life Park. He also visited several zoos, museums, and science centers. The result of this visit and extensive revisions of thoughts has results in the "notes for a University aquarium" which is attached. This remains a preliminary idea.

At their meeting on November 1, 1978, the University Board of Regents unanimously agreed to support a feasibility study for a public aquarium at the University.

Earlier ideas about an aquarium led to many discussions with Mr. Martin Pray of the Guam Visitor's Bureau. Bill No. 919 was introduced to the Fourteenth Guam Legislature in the late Fall but was never "heard."

An Ad Hoc Aquarium Planning Committee, as constituted by President Rosa Roberto Carter to include L.G. Eldredge (Chairman), J.A. Marsh, Jr., R.H. Randall, R.T. Tsuda, L. Raulerson, and D. Ballendorf of the University and H.T. Kami of the Guam's Division of Aquatic and Wildlife Resources, met briefly on February 13 to discuss plans.

Bill No. 203 "An act to implement a study and basic design for an aquarium project at the University of Guam" was introduced to the Fifteenth Guam Legislature by Frank F. Blas. Legislative hearing was held on April 3 to consider the appropriation of \$40,000 (from the Tourist Attraction Fund) to carry out an economic study and a building/facilities plan study. The bill was heard by Ways and Means Committee. Testimony was provided by Pete Ada (Chairman, Board of Regents) Rosa Roberto Carter (President), Audrey Camba (Director of Grants), and James A. Marsh, Jr. and Lucius G. Eldredge (Marine Laboratory), as well as Martin Pray (Manager, Guam Visitor Bureau), Nick Francisco (Commissioner, Mangilao), and Eric Forbes (Speaker, 4th Guam Youth Congress). Mr. Forbes spoke in support of an aquarium. The 4th Guam Youth Congress has since passed Resolution No. 40 in support of Bill No. 203.

The Chairman of Guam's Overall Economic Development Program (OEDP) Committee invited the University to submit specific projects

which might be included in the 1979 Economic Development Strategy for funding from the federal Economic Development Administration (EDA). A description of the University aquarium plan, along with others, was sent to OEDP on April 6. The aquarium was considered a proposed project under Title II (loans) of the OEPD Plan for Guam (June 1979).

Quite independently of the above, the staff economist of the Department of Commerce invited Dr. Eldredge to attend the regular OEDP Committee meeting on April 9 to discuss the aquarium plans in a "development strategy for tourism" session. At that time it was learned that both the Guam Hotel and Restaurant Association and the Japan-Guam Travel Association have given highest priority to an aquarium/botanical garden tourist development project in the area of business development loans. Dr. Eldredge was assured support by these two groups.

On April 17 Dr. Eldredge was invited to informally discuss the aquarium plans with Mr. M. McClure of the Guam Growth Council. This Council was interested in knowing whether there was planned any commercial business involvement, such as managerial or promotional. Dr. Eldredge suggested that all avenues of operation approach were open to discussion. The facility plan should address such questions as this. The Guam Growth Council might be instrumental in assisting with construction funding.

On June 4, 1979, Bill No. 203 was signed and became PL 15-29, appropriating \$40,000 "to fund the necessary studies for the construction of an aquarium." In October the funds were allocated to the University.

In December a contract to carry out a study to develop a public aquarium was signed with Kramer, Chin and Mayo of Seattle. This company's work is primarily that of running water systems for laboratories and aquaculture projects. They were the planners for the successful Seattle Aquarium. Dr. Eldredge met with representatives in Seattle in January.

Planners for Kramer, Chin and Mayo visited Guam and held public meetings on March 3 and May 8, 1980. The result was a program study which included information on the site, theme, storyline, size and cost, and architectural character, as well as two economic reviews for an aquarium. This "University of Guam Aquarium Programming Report" provided detail information which was abridged in a "Summary Report" (attached) which was received in September 1980.

In March 1980 the land problems which have plagued the University were settled, and Lots 5420 and 5397 Part were registered with the Department of Land Management. The Government and University lands should now be appraised.

The University Board of Regents reaffirmed their support of

an aquarium during their August 28, 1980 meeting. A Board Ad Hoc Committee was appointed and met in November and December 1980. Funding plans were investigated. Bill No. 263 "An act making an appropriation to the University of Guam to obtain architectural and engineering plans for the construction of an aquarium" was introduced into the Sixteenth Guam Legislature. Bill No. 263 was successfully heard on March 25, 1981 but never voted upon.

In August 1981 Dr. Eldredge began a sabbatical leave until May 1982. During that time he actively participated with the "Friends" group of the Waikiki Aquarium in Hawaii. He also participated in a planning workshop for an expanded "Hawaiian Islands Aquarium" being outlined by Kramer, Chin and Mayo. Additionally, during a visit to the mainland, Dr. Eldredge visited the New England, Mystic, and Baltimore Aquariums to further investigate aquarium design and concepts.

Upon his return to Guam, Dr. Eldredge met with Dr. Carter in July 1982, and it was agreed to hold further planning attempts in abeyance until after the November election. Thus, plans and thoughts continue for a University aquarium although some updating is needed. As an educational program it would add much to the University and to the island. It has been stated that an aquarium could increase tourism by 10% on Guam. Based on 1978's visitor spending, this increase could add \$10-14 million annually to Guam's economy.



Zoo and Aquarium Month, 1983

By the President of the United States of America

A Proclamation

As the living classroom for some 20 million school children each year, zoos and aquariums have an important role in the American educational process. They also provide stimulating recreational experiences for more than 125 million people who visit them annually.

The United States has some of the finest zoo and aquarium facilities in the world. Many are foremost in the effort to conserve the species they house. American zoos and aquariums cooperate with institutions around the globe to preserve wildlife and to create more sophisticated techniques for exhibiting animals in natural settings.

To both children and adults, animals represent a special sense of curiosity, feeling, and caring. ~~By enabling us to observe animals firsthand and to learn about their habitats,~~ zoos and aquariums have become a valuable and unique asset.

NOW, THEREFORE, I, RONALD REAGAN, President of the United States of America, do hereby designate the month of June 1983 as Zoo and Aquarium Month.

IN WITNESS WHEREOF, I have hereunto set my hand this 14th day of Feb., in the year of our Lord nineteen hundred and eighty-three, and of the Independence of the United States of America the two hundred and seventh.

Ronald Reagan

PUBLIC LAW NO. 15-29

Bill No. 203S
Enacted: June 4, 1979
Governor's Action: Approved
Riders: Yes

Introduced by: F.F. Blas

AN ACT TO IMPLEMENT A STUDY AND BASIC DESIGN FOR
AN AQUARIUM PROJECT AT THE UNIVERSITY OF GUAM.

- Section 1 Appropriates \$40,000 from Tourist Attraction Fund to UOG for said project.
Section 2 Amends Section 9, Pt. Five, P.L. No. 14-132 relative to effective dates for certain sections.
Section 3 Appropriates \$10,000 to the Micronesian Area Research Center, UOG for certain historical Navy documents.

BE IT ENACTED BY THE PEOPLE OF THE TERRITORY OF GUAM:

Section 1. There is appropriated from the Tourist Attraction Fund the sum of Forty Thousand Dollars (\$40,000) to the University of Guam to fund the necessary studies for the construction of an aquarium.

Section 2. Section 9 of Part Five of P.L. No. 14-132 is amended to read:

"Section 9. The appropriations made by Sections 6, 7 and 8 of Part Five of this Act shall be effective October 1, 1978 through September 30, 1979, or on the date specified in the official award letters from the Grantor Agencies."

Section 3. The sum of Ten Thousand Dollars (\$10,000) is appropriated from the General Fund to the Micronesian Area Research Center of the University of Guam for the purpose of obtaining copies of documents of the correspondence of Secretary of the Navy at the National Archives in Washington, D. C. These documents serve as the foundation for the annual reports written during the American Naval Government period of Guam.

PRO/TECH
STAFF

| NAME | TITLE |
|---|--------------|
|  | |
| JOSEPH F. ADA | Governor |
| FRANK F. BLAS | Lt. Governor |
| ANTHONY C. MARIANO | Director |

DEPARTMENT OF PARKS AND RECREATION

GOVERNMENT OF GUAM
490 Naval Hospital Road
Agana Heights, Guam 96919
Telephone: (671) 477-9520/1



CHAIRMAN, COMMITTEE ON TOURISM,
TRANSPORTATION & COMMUNICATIONS

OCT 25 1989

REC'D BY: Janet

DATE: 10-30-89 TIME: 10:40

ANTHONY C. MARIANO
Director

DENNIS M. ZERMENO
Deputy Director

The Honorable John Perez Aguon
Chairman, Committee on Tourism and
Transportation
Twentieth Guam Legislature
163 Chalan Santo Papa St.
Agana, Guam 96910

FILE

Dear Senator Aguon:

I am testifying on Bill No. 999, an act to establish an Advisory Council to determine the feasibility of establishing a Territorial Aquarium to appropriate twenty-five thousand dollars from the Tourist Attraction Fund for funding purposes.

Our department is supportive of establishing an aquarium on Guam, a facility that would display the marine life in the water of Guam. Perhaps, the first component of the study should be to reevaluate the previous study that was to establish an aquarium at the University of Guam Marine Laboratory.

Therefore, we support the intent of Bill No. 999.

Sincerely,

ANTHONY C. MARIANO
Director



DEPARTMENT OF LAND MANAGEMENT
GOVERNMENT OF GUAM
AGANA, GUAM 96910

CHAIRMAN, COMMITTEE ON TOURISM,
TRANSPORTATION & COMMUNICATIONS

REC'D BY: Jamet

DATE: 11-2-89 TIME: 10:00

October 30, 1989

The Honorable John P. Aguon
Chairman, Committee on Tourism
and Transportation
Twentieth Guam Legislature
Agana, Guam 96910

Subject: Legislative Bill No. 999

Dear Mr. Chairman:

The Department of Land Management fully supports the intent of Bill 999 and we recommend that it be implemented at the earliest possible time. We further recommend that the Officer in charge of the University of Guam Marine Laboratory be designated as the Vice Chairman of the Advisory Council.

Guam is surrounded by clean water with varying species of interesting marine life and we must take advantage of this resource not only for the enhancement of our tourism industry but also for the benefit of our local residents and most importantly, our school children.

The Department will stand prepared in rendering any and all of its required assistance.

Sincerely,

F. L.G. CASTRO
Director, Department of
Land Management

COMMONWEALTH NOW!!!
CLOSER PARTNERSHIP WITH AMERICA LONG OVERDUE



DEPARTMENT OF COMMERCE
 DEPARTAMENTON I KOMETSIO
 GOVERNMENT OF GUAM
 SUITE 601, 6th FLOOR, GITC BLDG.
 590 SOUTH MARINE DRIVE/
 TAMUNING, GUAM 96911
 Tel: 646-5841/4
 Fax: 646-7242



*Some
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October 23, 1989

The Honorable John P. Aguon
 Chairman, Committee on Tourism & Transportation
 Twentieth Guam Legislature
 324 Soledad Avenue, Suite 202
 Agana, Guam 96910

CHAIRMAN, COMMITTEE ON TOURISM
 TRANSPORTATION & COMMUNICATIONS

REC'D BY: *Janet*

DATE: 10-23-89 TIME: 4:30

Dear Senator Aguon:

This is in response to your letter of October 18, 1989 concerning the following bill:

BILL 999 - AN ACT TO ESTABLISH AN ADVISORY COUNCIL TO DETERMINE THE FEASIBILITY OF ESTABLISHING A TERRITORIAL AQUARIUM AND TO APPROPRIATE TWENTY FIVE THOUSAND DOLLARS (\$25,000) FROM THE TOURIST ATTRACTION FUND FOR FUNDING PURPOSES

With regard to Bill 999 we are very supportive of such a project. In fact, a project directly related to this is listed in the 1989 - 1993 Overall Economic Development Plan (OEDP) as "Development of a Tourist-Oriented Marine Life Display Facility at the University of Guam Marine Laboratory". This is under Tourism Capital Improvement Projects and is targeted for FY 1991 - FY 1993. It would be appropriate to address this project within the scope of the task force.

We also feel that the development of an aquarium falls directly in line with the following tourism objective in the OEDP:

11 - "To design and create new tourist attractions in a manner that they will appeal to a wide socio-economic range of visitors and residents in order to provide a greater variety of activities while preserving and displaying Guam's history, culture and environment."

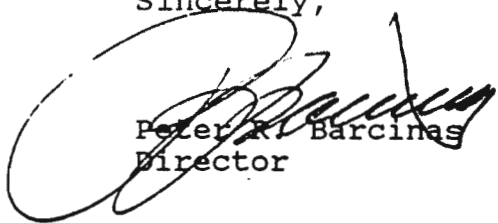
These are the types of attractions that allow for increased diversification of our visitor markets and helps to better define Guam's image as a quality island destination. It also is valuable to

both the scientific community as a research environment and to the public at-large as an educational resource and a facility that will be worthy of civic pride.

However, we would like to recommend that Section 2 of the bill be revised to direct funding specifically for securing commercial contractual services required in the preparation of the feasibility study that can not be carried out by the government in the time allowed in Section 3 of the bill. Your committee might also want to consider a requirement for an audit of the funds by the Bureau of Budget and Management Research to be submitted with the final report to the legislature.

If you require additional information on our concerns and activities in the above areas, please do not hesitate to contact my office.

Sincerely,



Peter R. Barcinas
Director

PRO/TECH
STAFF



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GOVERNMENT OF GUAM
AGANA, GUAM 96910

CHAIRMAN, COMMITTEE ON TOURISM & TRANSPORTATION & COMMUNICATIONS

REC'D BY: Janet

DATE: 10-31-89 TIME: 1:2

OCT 27 1989

Senator John P. Aguon
Chairman
Committee on Tourism & Transportation
20th Guam Legislature
P.O. Box CB-1
Agana, Guam

Hafa Adai Senator Aguon:

I appreciate this opportunity to provide comments on Bill 999, An Act to Establish and Advisory Council to Determine the feasibility of Establishing a Territorial Aquarium and to Appropriate Twenty Five Thousand Dollars (\$25,000) from the Tourist Attraction Fund for Funding Purposes.

The Bureau of Planning fully supports the intent of this bill. An aquarium is not only a logical "attraction" for tourism, but would be extremely beneficial in educating Guam's children in knowledge of their unique environment. Whether such an aquarium is operated solely as a government facility, solely as a private facility, or in combination between the two sectors, an aquarium is long overdue for our island.


There are just two minor points I would like to make, in regard to Bill 999. First; I suggest that the words within the Bureau of Planning (Section 1, line 2), be stricken. They are unnecessary and may infer a permanent and separate entity within the Bureau.

Second; while I believe the Bureau should play a role in assessing and developing such a project, I must suggest that the Bureau is not the best lead agency (or chair) for this council. Any eventual management scheme for a public aquarium would probably involve a "troika" of Department of Parks and Recreation, University of Guam Marine Lab, and Department of Commerce, (or Guam Economic Development Authority, in that GEDA has the current statutory framework to engage in private sector partnership arrangements). Therefore, in order to create a linkage between proposal and product, I suggest that the Director of Department of Parks and Recreation be the Chair of this Council.

In relation to the second point, above, I would further suggest that the appropriation in Section 2 be made to the Department of Parks and Recreation, rather than to the Bureau.

Once again, I thank you for this opportunity to comment. This bill addresses a very real need, and the Bureau fully supports the intent of this legislation.

Si Yu'os Ma'ase


Peter P. Leon Guerrero
Director