MARINE LEARNING CENTER SCOPING STUDY
Pier One, Fort Mason Center

February 18, 1994

National Fish and Wildlife Foundation
National Oceanic and Atmospheric Administration

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Arrigoni & Ross, Inc.

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A report of
the National Fish and Wildlife Foundation and
Backen Arrigoni and Ross, Inc.

pursuant to
the National Oceanic and Atmospheric Administration
Award No. NA37OMO440.

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EXECUTIVE SUMMARY

In 1980, the Golden Gate National Recreation Area *General Management Plan* outlined development of Fort Mason and stipulated a "pier structure and warehouse will be adapted to accommodate programs concerning San Francisco Bay marine ecology."[1] The GMP suggested that the center attract both drop-in visitors and school groups and have exhibits covering a wide range of marine issues. Docking space for associated research vessels was encouraged at the adjacent pier apron.

Two years later (1982), The Fort Mason Foundation, in *The San Francisco Bay Museum Development Plan*, discussed the issues surrounding the establishment of an environmental museum at Fort Mason Center. The museum would exhibit the marine environment of the Bay Area and would occupy all of Pier One. At that time, the GGNRA required space in Pier One and further discussion of a marine learning center was postponed.

With the conversion of Fort Mason, marine related groups did locate on-shore in warehouse Building E; most notably, the J. Porter Shaw Library of the SF Maritime National Historical Park, and Oceanic Society Expeditions. The organization Baykeeper located in the ocean end of Pier One and Environmental Travelling Companies have offices in Building C. Piers Two and Three became large exhibit halls and theater space, and a majority of Pier One was reserved as a maintenance building for the National Park Service.

At the end of 1989, the concept of locating a marine learning center in Pier One was re-examined. Given the range of existing and proposed marine related facilities in the Bay Area, the need for an additional facility was questioned. The National Park Service enlisted the services of the California State Coastal Conservancy to assess the potential of a marine learning center at Fort Mason. The findings of the California State Coastal Conservancy reconnaissance survey indicated that a marine learning center was still appropriate and outlined possible activities, user and program groups, and areas of marine related programming. Furthermore, with the conversion of the Presidio to the Golden Gate National Recreation Area, NPS operations could be relocated, freeing space in both Building E and Pier One. With dramatic views and an outstanding location, Pier One was designated as a viable site for a marine learning center.

A further feasibility study was conducted by the California State Coastal Conservancy in September 1993. The report outlined the interpretive niche a marine learning center might address, discussed opportunities and constraints of the site, proposed an organizational structure for the facility, explored funding and financial feasibility and presented three programmatic scenarios. The conceptual programs for the facility were based on 1) the Fort Mason Foundation recommendations of space allocation, 2) the minimum size the California State Coastal Conservancy felt was necessary to present an interpretation of Bay Area ecological processes, and 3) a maximum scheme modelled after the Coyote Point Museum. None of the alternatives addressed the possibility of using the entire pier for a marine learning center and none proved to be financially self-supporting.

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1 Golden Gate National Recreation Area, General Management Plan, Department of the Interior, National Park Service, September 1980, p. 41.

As the State Coastal Conservancy feasibility study was being concluded, the National Oceanic and Atmospheric Administration and the National Fish and Wildlife Foundation expressed interest in using the entire pier for the development of a marine learning center facility. Backen Arrigoni & Ross, Inc. was retained to study the issues surrounding feasibility of the development of the entire pier.

Current Scoping Study

The objective of this scoping study was to test the feasibility of the Marine Learning Center through the investigation of the following issues:

1. How is the concept of a Marine Learning Center generally to be defined -- what would be in it, how big would it be, what "message" should it convey, about how many people might visit it and/or participate, and approximately how much would it cost?

2. How would a "Marine Learning Center" and its attendant impacts (negative or positive) be received/viewed/accepted by the local community roughly defined as the Fort Mason Board, other Fort Mason tenants, the Marina neighborhood and the GGNRA?

3. How would it be viewed by local officials -- elected and appointed -- and by State and Congressional political representatives?

4. In broad terms, what are the economics of a Marine Learning Center at the Pier 1 location? What might revenues, income and costs be, and what sources of funding could be available?

Preliminary Findings

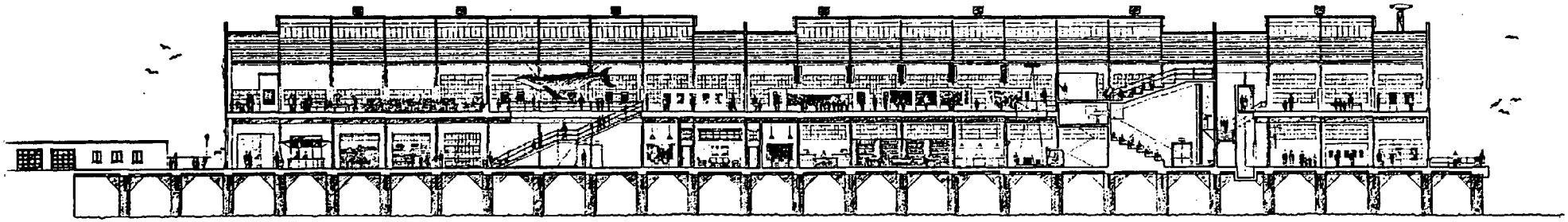
The goal of this scoping study was not to pursue and examine all of the above issues in detail, rather it was to quickly identify any obvious and insurmountable obstacles to the realization of a Marine Learning Center in the whole of Pier One. No insuperable obstacles were found. Pier One is a reasonably sound building, with outstanding architectural features requiring some structural and building improvements. Fort Mason is an fitting location for this type of science center. A workable program for the Marine Learning Center can fit into Pier One and could attract a significant audience. It is likely that the Center will be financially stable, and may even make a certain amount of money for capital improvements. Local political constituencies view the project favorably.

Most importantly, the mission of the Marine Learning Center can fill an important gap in the Bay Area comprehensive marine ecology interpretation. Also using the Sanctuaries and Reserves programs of the National Oceanic and Atmospheric Administration, there is a real need for a facility with a focus that could lend supportive arms to existing marine related organizations and programs.

Remaining Issues

The section of this report titled "Next Steps" discusses specifically the course the project should take. The following actions are vital to the continued development of the Marine Learning Center:

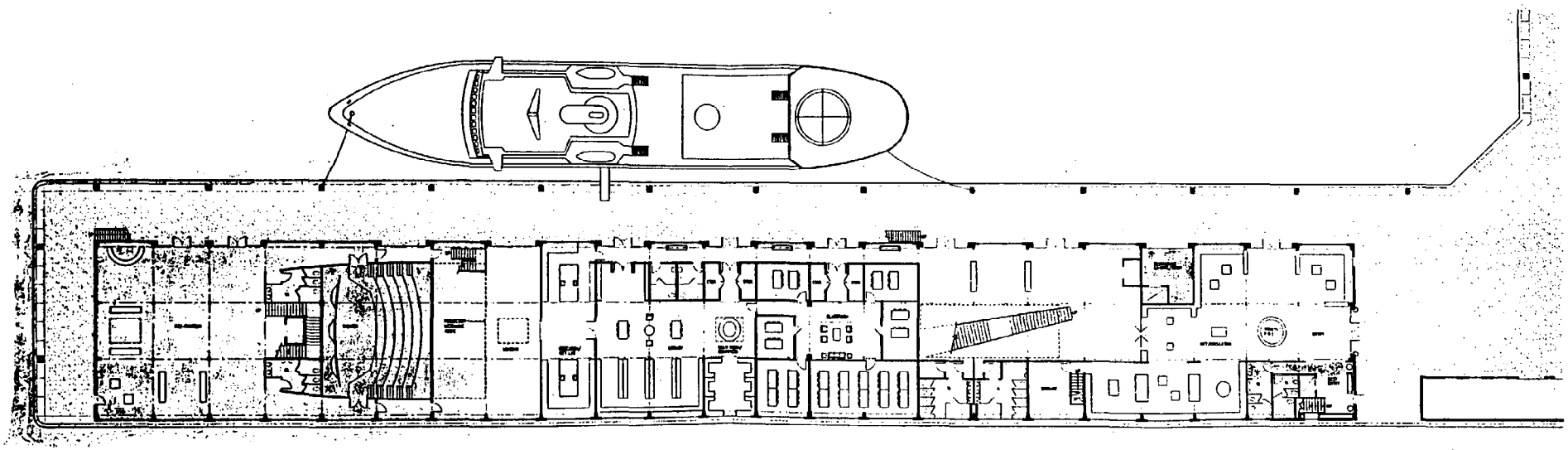
- **Additional reconnaissance of Pier One, especially structural analysis.**
- **Input from the community be continued.**
- **Access plans and mitigations benefits be assessed.**
- **Management and organization of the MLC be defined to lead the project effort.**
- **Further discussions with Fort Mason Center regarding impact issues be continued.**
- **The program and the mission statement be refined.**



SECTION

MARINE LEARNING CENTER

NATIONAL FISH & WILDLIFE FOUNDATION

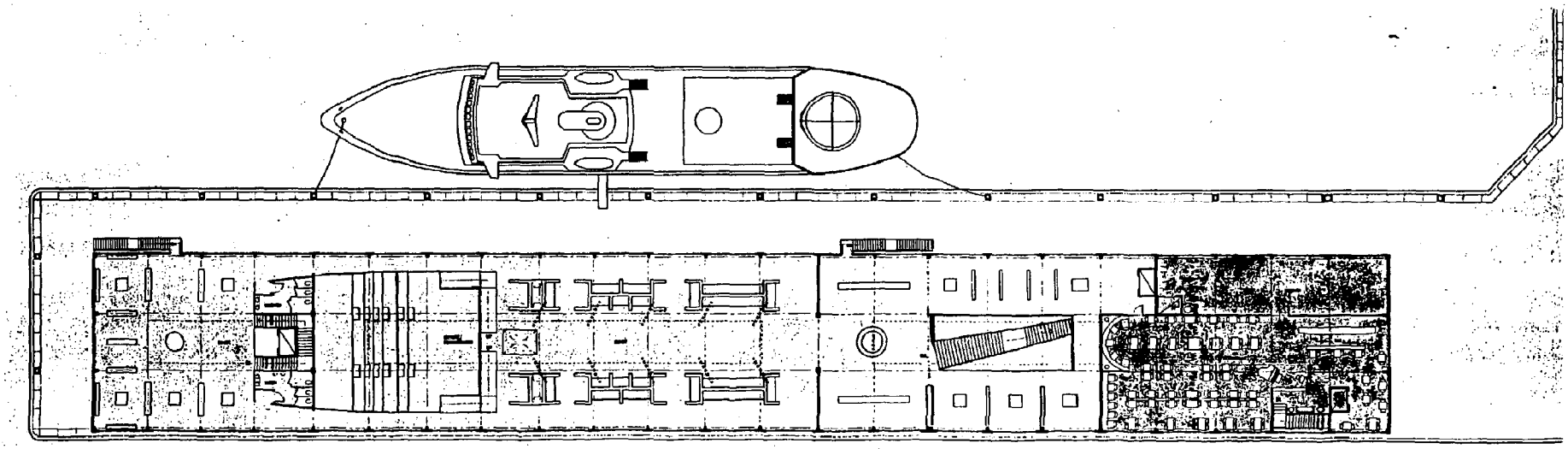


FIRST FLOOR PLAN

EXHIBIT AREA
THEATER
ENTRY / GIFT STORE
LEARNING CENTER
RESTAURANT
LOADING

MARINE LEARNING CENTER

NATIONAL FISH & WILDLIFE FOUNDATION



SECOND FLOOR PLAN

EXHIBIT AREA
THEATER
ENTRY / GIFT STORE
LEARNING CENTER
RESTAURANT
LOADING

MARINE LEARNING CENTER

NATIONAL FISH & WILDLIFE FOUNDATION

VISION FOR THE CENTER

Every successful science center requires a strong curatorial philosophy, or "vision." This vision inspires the theme of the exhibits, guides the architectural development of the facility and directs the emphasis of educational programs. From the beginning, the mission of the Marine Learning Center has been to provide a rich and engaging atmosphere for learning and exploring a broad range of marine issues. Using interactive experiences, the Center will inspire visitors to continue learning, encouraging active involvement in stewardship programs. Experiences at the Center are to be the beginning of life-long participation in, and understanding of, the estuary and ocean environments.

History of the Vision

The original concept of the Marine Learning Center in the *General Management Plan for the Golden Gate National Recreation Area*, 1980, was as follows:

> ... to accommodate programs concerning San Francisco Bay Marine ecology. Specific programs and exhibits offered in these facilities should appeal to drop-in visitors as well as to local school groups and could cover such subjects as marine wildlife, tidal dynamics, bay pollution, and shipping. Although some static museum presentations may be included, emphasis should be placed on visitor participation in learning experiences. Space for docking appropriate research vessels relating to the above programs will be provided adjacent to the pier structure.

More recent discussions with the National Park Service have confirmed these goals. The Marine Learning Center should inspire people to extend their experience of the marine environment once they have visited the Marine Learning Center. The National Park Service commonly uses interpretive centers at the National Parks to prepare visitors for an experience of the natural environment. Geological processes are explained and orientation videos are common. Where possible research techniques are demonstrated, such as at the Fossil Beds National Monument in Wyoming.

Pier One - Marine Learning Center Feasibility Study, September 1993, by the State Coastal Conservancy, outlined a broad interpretive niche for the Marine Learning Center based on interviews with existing organizations. The topics to be comprehensively explained at the facility would be:

- Ecology and the principles of water,
- Marine policy,
- Urban environmental education,
- Conservation,
- Comprehensive treatment of the San Francisco Bay-Delta-Ocean system,
- Habitats,
- Oceanographic, climatic and geological processes,
- Estuarine processes,
- Aquatic food chains,
- Navigation and the shipping industry,
- Fishing industry

"In summary, the goal of an interpretive component should be to have visitors come away from the MLC with a vivid picture of the whole San Francisco Bay-Delta-Ocean system, how water is the vital, fluid medium that makes the system healthy, how interventions in the system creates critical changes, and how human beings affect and are affected by these changes.

The marine environment and its ecology is potentially so broad and all encompassing that the Marine Learning Center will need to define a "lens" to provide focus for the vision. The Sanctuaries and Reserves Programs offer a unique structure for this "lens." Programs should include reference to NOAA's goals of "marine protection, conservation and preservation", and have a strong multi-lingual and multi-cultural emphasis. A visitor should be able to come to the facility to experience and learn about the local Marine Sanctuaries such as the Gulf of the Farallones and Cordell Bank, as well as about the history of the Marine Sanctuaries Program, the Natural Estuary Research and Reserves Program, Marine Sanctuaries and Research Reserves throughout the world. Broad topics can be interpreted using examples from specific ecosystems protected in the Marine Sanctuaries and Estuary Reserves.

An example of a mission statement of the Marine Learning Center would be the one for the Monterey Bay Aquarium. Where the Monterey Bay Aquarium focuses on the Monterey Bay, the mission of the Marine Learning Center would be...

...to stimulate interest, increase knowledge and promote active protection, conservation and preservation of the San Francisco Bay Estuary, local Marine Sanctuaries and world's ocean environment through innovative exhibits, public education and scientific research.

Uniqueness of the Marine Learning Center

Several factors combine to create a unique science center. Two radically different science centers can have identical floor plans and types of attractions. The *content and emphasis* of the exhibits and programs determines the nature of the center. A combination of mission statement, mentor organization, scope of facility, geographical focus and target audience produces the content and thus, the character of any facility.

The attached chart, "Local Facilities Comparison", compares the character of the Marine Learning Center to other existing or proposed facilities in the San Francisco Bay Area. The Monterey Bay Aquarium is used for comparison, although it is out of the visitor "catchment basin" of the Marine Learning Center. It is a very successful facility and the mission statement of the Marine Learning Center is modelled on it.

Study of the chart reveals the fundamental differences between all of the facilities. The Bay Model deals almost exclusively with Bay hydrology using a model exhibit. The Steinhart Aquarium is part of a traditional natural science museum and demonstrates the marine environment almost exclusively using aquariums. Underwater World is built as a tourist attraction, mainly for entertainment purposes, and has enormous aquariums as its main visitor experience. The Commercial Fisheries Center is tied intimately to the fishing industry and its exhibits, facilities, and attractions reflect this relationship. Marine World is also entertainment oriented, using live animals as its main attraction. The Monterey Bay Aquarium focuses closely on the Monterey Bay ecosystems and also uses aquariums as its main teaching tool.

The Marine Learning Center will geographically focus on the San Francisco Bay Estuary and local ocean environment. Specific examples of the Gulf of the Farallones and Cordell Bank resources will be exhibited. Connections between the delta and bay and ocean ecosystem will be demonstrated. Visitors will actually participate in studies being done at the Research Reserves. Excursions to Farallones or other places will be made available.

Targeting non-traditional audiences is a high priority in Marine Learning Center planning. Programs will be multi-lingual and multi-cultural, similar to the Los Marineros program at the Sea Center in Santa Barbara. Teaching and exhibit programs will be multi-faceted for different learning levels and for diverse cultural groups.

Interactive exhibits will be the main teaching tool of the Marine Learning Center. "Live links" will be set up to various remote locations allowing visitors to participate in researches. Access to the NOAA research vessel and on-site research facilities encourages "real world" experiences. Visitors will be able to touch the water of the bay and the building itself will become a teaching tool as the environment below the pier is explored by an "under pier" walk.

Local existing marine-related organizations and programs will be encouraged to use the Marine Learning Center as a supportive facility; high technology could allow for an "educational clearinghouse" for programs or volunteer opportunities. Dock space for excursions will be available and the facility could be used for "pre-outing" orientation.

Exhibit Program

Specific exhibits have not yet been designed for the Marine Learning Center. In the conceptual design of Pier One as a Marine Learning Center, what might be contained within it and the experiences of the visitors were extensively discussed. For example, the following could be exhibited:

- Retired NOAA research vessel: A 250± foot vessel could be available to be docked next to the Marine Learning Center (MLC). This could function as a variety of spaces; classrooms, exhibit, sleeping and research; and develop into a main attraction. The ship is a former destroyer escort called "Surveyor".

- Information gathered by US Navy: With the recent declassification of Navy research, it is possible to develop exhibits using bio-acoustics, geology, etc. inspired by Navy data. It is possible that the Navy will be interested in using opportunities at the MLC to relay information to the general public.

- Simulated submarine dive using video technology. Interactive exhibits using

technology such as Remotely Operated Vehicle (ROV) to explore pilings of Pier One. A natural history of the San Francisco Estuary and Bay in dynamic format (movie, video, etc.) could also be developed.

- MLC as final site of National Museum of Natural History "Ocean Planet" or other travelling exhibit. Excerpts from a press release of "Ocean Planet" are in the appendix. The described exhibits are useful as models of the type of interactive exhibits that would be within the Marine Learning Center.

- Use of "information super highway" possible to utilize television and MLC for the staging of environmental information transfer, status boards, etc.

- Consider that the National Biological Survey may move to the Presidio. The MLC should emphasize bio-diversity as a theme.

- Construct a" below pier" walk to allow visitors a first hand view of marine life attached to the caissons. The walk could be constructed with a "glass bottom boat" component and lit so there is a possibility to see underwater life.

- The research and resources of the future San Francisco Bay National Estuary Research Reserve could be interpreted at the Center. Visits to Reserve sites could be part of the educational programs of the Center. Currently no other facility in the Bay Area offers the access or information to an estuarine environment that will be available through the SFBNERR.

The Center for Marine Conservation, under the direction of Burr Heneman has proposed "a new interactive, multi-media approach to making our natural and human marine environments more accessible to the public." The program emphasizes that the best way to experience the ocean world is to get as close as possible to it:

"It would be operated by the National Marine Sanctuary Program and its cooperating association. Other participants in the project could include GGNRA, a Bay tour boat operator, various elements of the maritime industry, Point Reyes Bird Observatory, US Fish and Wildlife Service and the fishing industry.

The guts of the system would be housed in the Marine Learning Center at Pier 1 in Fort Mason, however Pier 1 - with its visitor center, classrooms, and lecture hall - would be just one of the locations for applying this system in the Gulf of the Farallones region. To be most successful, the Marine Learning Center will break out of the walls of Pier 1 and reach people elsewhere. Bay and Farallones tour boats, the Point's Reyes Lighthouse, Pier 39 in San Francisco, the Cliff House in San Francisco, the Army Corps' Bay Model in Sausalito, schools or any place where people congregate on or near the water. Eventually, Monterey Bay locations could be added to the system, or a similar system could be developed for that area."

Burr Heneman goes on to describe the Marine Learning Center in exciting prose. Using high-tech imaging and interactive video, it would be possible for visitors to directly contact, fishing boats or remote locations. Cameras could be located around the pier and live video transmitted from various locations; Yerba Buena, Port of Oakland, the Farallones or other coast environments. The text of the Center for Marine Conservation proposal is in the appendix.

Conclusion

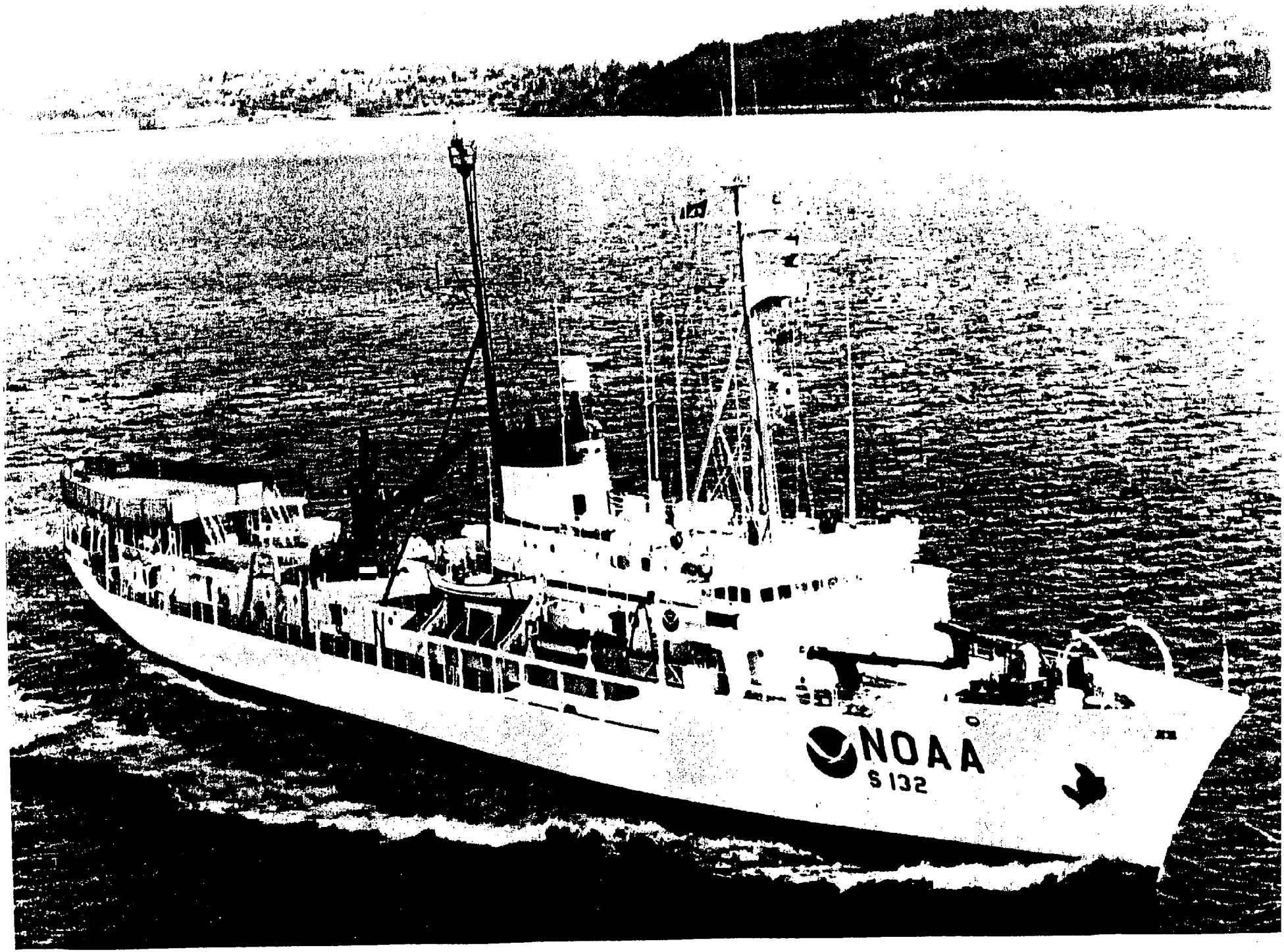
The development of the Marine Learning Center is a timely endeavor. Public concern for the marine environment is at an all time high. The passing of the Comprehensive Coastal Management Plan and the establishment of the San Francisco Bay National Estuary Research Reserve support the concept of the Marine Learning Center. The revitalization of the waterfront of San Francisco points to increased public interest in marine issues.

A unique mission, superior location and dynamic exhibits and experiences can combine to make the Marine Learning Center a facility of special significance in the Bay Area and the United States. The Marine Learning Center will need a multitude of creative interactive exhibits to capture the complexity of the ocean environment and experience. The resources of the Marine Sanctuary Program can be used as the basis of exhibits and experiences.

A strong curatorial philosophy with a strong multi-cultural and multi-lingual emphasis should coordinate center programs and development. Most importantly, the Marine Learning Center should actively engage visitors. The most exciting learning environments occur when information is "fun", packaged in an entertaining manner. Done properly, "entertaining" and "educating" are not mutually exclusive; in fact, our best learning is done while we feel the intensity generated by well-done entertaining. No other existing or proposed facility in the region approaches education of marine-related in this particular manner.

LOCAL FACILITIES COMPARISON

	MISSION/PURPOSE	*PRINCIPAL EMPHASIS*	*SPONSORSHIP/MENTOR ORGANIZATION*	*SCOPE OF FACILITY*	*GEOGRAPHICAL FOCUS*	*TARGET AUDIENCE*
MARINE LEARNING CENTER	To stimulate interest, increase knowledge and promote active protection, conservation and preservation of SF Bay Estuary system and local marine sanctuaries, and the Ocean environment through innovative exhibits, public education and scientific research."	*Education/ Entertainment*	*Non-profit public, NOAA (Sanctuaries and Reserves Division)*	*Interactive exhibits, high-tech educational tools, extensive education facilities*	*Global w/emphasis on SF Bay Estuary and local Marine sanctuaries.*	School Children, strong multi-lingual and multi-cultural emphasis, (non-traditional audience) Tourists
BAY MODEL	Hydraulic model for SF Bay for research purposes.	*Education/Entertainment*	*US Army Corps of Engineers*	*Bay water flow demonstration model.*	*SF Bay*	School Children
CALIFORNIA ACADEMY of SCIENCES (Steinhart Aquarium)	Study, display and interpretation of natural science collections.	*Education*	*Private non-profit, City and County of SF*	*Aquariums, static display, lab and class space.*	*Global*	School Children, Tourists, Informal adult education
UNDERWATER WORLD (under development)	Entertainment, education	*Entertainment*	*Private corporation*	*Habitats, Aquariums*	*Pacific Ocean*	Tourists, Informal education
COMMERCIAL FISHERIES CENTER (under development)	Initial concept of the Center os "to provide education and training for fishermen, processors and distributors regarding current and future industry procedures and technology; provide training in seafood buying, and marine ecology.	*Industry Support, Education*	*San Francisco Port Commission*	*Visitors Center with Policy Center, International Center, demonstration kitchen, public fish market.*	*Pacific Fisheries*	Fishermen, Processors, Tourists, Adult education
MARINE WORLD	To enhance public understanding of wildlife and conservation ethics, affordable education for individuals and their families.	*Entertainment*	*Non-profit, City of Vallejo*	*Educational Exhibits and Shows*	*Global w/Northern California emphasis*	School Children, Tourists,
MONTEREY BAY AQUARIUM	To stimulate interest, increase knowledge and promote stewardship of Monterey Bay and the world's ocean environment through innovative exhibits, public education and scientific research.	*Education/Entertainment*	*Non-profit public*	*Aquariums*	*Monterey Bay*	School Children Researchers Informal adult education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REGIONAL INFLUENCES

Given the beauty and uniqueness of the San Francisco Bay Area, and the concern Californians have for the degradation of the marine and estuarine environments, public interest in marine issues has accelerated in recent years. Upwards of one hundred groups offer educational programs and opportunities of some type to those interested in learning more about marine issues. The Marine Learning Center offers a unique opportunity to provide a unified construct these organizations. Specific organizations discussed below could be expected to contribute the development or programs of the Marine Learning Center.

In addition to the marine organization and facilities (as described in the previous section, "Vision for the Center") existing in the Bay Area, two events combine to create a window of opportunity for the Marine Learning Center. Both the conversion of the Presidio and passing of the Comprehensive Conservation and Management Plan for the San Francisco Bay and Delta set the stage for successful realization of the Center.

Marine Sanctuaries Program

If the National Parks are considered "America's crown jewels" on land, then Marine Sanctuaries are the diamonds of the oceans. Currently, there are 13 Marine Sanctuaries, three of which lie outside or near the Golden Gate; the Gulf of Farallones Sanctuary, the Cordell Bank Sanctuary and the Monterey Bay Sanctuary. The marine resources in these sanctuaries have unrivaled diversity and represent a spectrum of habitats from intertidal to pelagic and deep ocean systems.

All marine sanctuaries fall under the management of the National Oceanic and Atmospheric Administration's Sanctuaries and Reserves Division. NOAA and the Gulf of Farallones Sanctuary have taken the lead in this scoping study of the Marine Learning Center. The executive summary of the Gulf of Farallones National Marine Sanctuary is included in the appendix.

With a vast array of resources and habitats, the marine sanctuaries have not yet received the public support and understanding that the National Parks have enjoyed. Little is known about the unique geography that contributes to the bounty of the sanctuaries or how sanctuary resources effect the social or economic well being of the Bay Area. In order to promote their goals toward greater public education, NOAA has recently committed significant effort to develop the Marine Learning Center at Fort Mason. The Center is to be a stepping off point for further exploration into the oceanic environment. Currently, there are no other facilities in the region that begin to address the importance or uniqueness of the local marine sanctuaries.

At the time of the report, effort was underway to establish a non-profit 501-C-3 cooperative association for the Gulf of Farallones National Marine Sanctuary. This association would have the capacity to raise funds, organize a marketing effort, provide direction for the actual development of the Marine Learning Center and then oversee daily operations. The cooperative association is expected to be in place by the end of 1994.

San Francisco Bay National Estuarine Research Reserve

The San Francisco Bay National Estuarine Research Reserve (SFBNERR) is expected to be designated in 1995. There are 21 such Research Reserves in the United States. The National Estuarine Research Reserve System Program is a federal/state partnership under the National Oceanic and Atmospheric Administration Sanctuaries and Reserves Division with San Francisco State University taking the lead in the Bay Area. Funding for the program is matched equally by the state and federal government.

The goals of the SFBNERR are to establish a representative estuary system within the San Francisco Bay Estuary. Tidal marshes will be the focus and the program will provide emphasis for research efforts of the SF Estuary Program. The research sites will be control points for wetlands and estuary restoration, and SFBNERR will provide a coordinated regional approach for public lands of varying jurisdictions.

The SFBNERR is not planning a visitors center but does have access to "Construction and Acquisition" funding. Also, the SFBNERR has indicated a strong interest in developing educational programs and research projects that could be coordinated through the Marine Learning Center. Trips to visit the Research Reserve could be a regular part of the Marine Learning Center.

Given that the philosophical basis for the SFNERRSP is very similar to the Marine Sanctuaries Program, these two bodies could work in conjunction to develop programming for the Marine Learning Center. The two agencies would inspire strong comprehensive interpretation of estuary and marine system. With the resources of both the local Research Reserve and Marine Sanctuaries to inspire visitors, the Marine Learning Center could become a truly dynamic facility.

San Francisco Bay Environmental Action Center

In 1991, in the course of the State Coastal Conservancy reconnaissance study for Pier One, almost two dozen marine educational organizations were interviewed. The groups provided input on possible activities, program groups, user groups, and the scope of marine-related programming that could be addressed by a marine learning center at Fort Mason.

The State Coastal Conservancy Feasibility Study also identified several organizations that intended to form a consortium called the San Francisco Bay Environmental Action Center (SFBEAC) to develop and operate a Marine Learning Center at Pier One. This group included Baykeeper, Earth Island Institute, the Gulf of the Farallones National Marine Sanctuary Program, the Resources Renewal Institute, Environmental Travelling Companions and Oceanic Society Expeditions. Other potential members included the Marine Mammal Fund, the Center for Marine Conservation, and the MARE Program at the Lawrence Hall of Science.

Recent informal conversations with Baykeeper, Environmental Travelling Companions and others involved with the initial consortium organization confirmed

a strong interest in developing a facility that would provide a network for sharing information between all Bay Area marine educational organizations. Specifically, the SFBEAC was to provide a "resource center focusing on San Francisco Bay environmental issues, a GFNMSP (Gulf of the Farallones National Marine Sanctuary Program) visitors center, pier apron interpretation, education/action programs specifically targeted towards multi-culturalism and youth leadership, volunteer recruiting and training programs."[1]

The detailed organizational and management policies of the Marine Learning Center are beyond the scope of this study. Certainly, the functional aspects as described above are achievable and the Marine Learning Center must be developed with full consideration of previously involved parties.

Commercial Fisheries Center

The Commercial Fisheries Center is part of a large rehabilitation project undertaken by the Port of San Francisco. Three components are being proposed; modern fish handling facilities, new berthing and support facilities for commercial fishermen, and the Fisheries and Environmental Research Center. The latter component will included a 35-65,000 square foot interpretive center, a library, conference and policy center, a seafood education area, and a snack bar. Also, Underwater World at Pier 39 has expressed interest in locating their fish husbandry unit as part of the Center. The total area of the Fisheries and Environmental Research Center is expected to be 137,000 square feet. The focus of the Research Center would be fisheries management, resources and ecosystems.

The Port has contracted the Coastal Resources Center and design firm Kwan Henmi to study the feasibility of the Fisheries and Environmental Research Center. Three schemes have been developed for review by the Port and will be available for public review in April and May of this year. Marketing surveys are to be completed by the end of January 1994 and potential funding sources and construction costs are currently being researched.

The vision for the Marine Learning Center is decidedly different than that of the Fisheries and Environmental Research Center. Differences in size, program and mission statement distinguish the two centers from one another. However, the Coastal Resources Center has expressed concerns regarding the simultaneous development of the two centers and recommends a coordinated and complementary effort when funding sources are to be identified. The CRC also encourages joint promotion activities and has suggested that pier apron interpretive space could be available to the Marine Learning Center.

More information about the mission of both centers is required before any kind of collaborative development effort is undertaken. A cooperative association or other agency guiding the Marine Learning Center should continue the dialogue with the Fisheries and Environmental Research Center to assure non-duplicative programs.

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[1] Pier One - Marine Learning Center, Feasibility Study, the State Coastal Conservancy, September 1993, page 22.

Comprehensive Conservation and Management Plan (CCMP)

In 1987, the U.S. Congress established the National Estuary Program to be administered by the Environmental Protection Agency. The San Francisco Estuary Project is one of the management conferences supported by the National Estuary Project. The mission of the SFEP was to develop the Comprehensive Conservation and Management Plan (CCMP) for the Bay/Delta estuary, recently signed into law by the governor of California.

The Comprehensive Conservation Management Plan addresses the need to restore and maintain the Bay/Delta estuary's chemical, physical and biological integrity. The main actions of the plan are legislative and regulatory with an educational component.

The San Francisco Estuary Project is an "inspiring body," and focuses on extensive educational outreach and policy development. The group is organized through the EPA with a wide volunteer base. The Project has no educational or visitor facility. Currently, the Project is drafting actions to implement the CCMP including writing a model wetlands ordinance and municipal general plan amendments. The project is looking to the U.S. Congress for funding to implement policies.

The San Francisco Estuary Project is expected to be very active in the restoration of the San Francisco Bay in the coming years. In particular, the San Francisco Bay National Estuary Research Reserve may act in part to implement CCMP and SFEP educational goals. Potentially, funding for education programs and interpretation will be available through the EPA and other sources. The Marine Learning Center management should assess the possibility and benefit of collaborating with the SFEP regarding interpretation of San Francisco Bay issues.

Conversion of the Presidio

In 1972, when Fort Mason was turned over to the National Park Service, provision was also made to transfer the Presidio of San Francisco, should the Sixth Army ever leave. The National Park Service will control the Presidio as of 1995 and already oversees portions of Baker Beach, Crissy Field and Fort Point. Once the Presidio becomes fully public, the Marine Learning Center will sit directly in the middle of an active waterfront extending from the Embarcadero to Fort Point and the Golden Gate.

Most importantly, the vision of the Presidio intends "a global center dedicated to addressing the world's most critical environmental, social and cultural challenges".[1] The mission of the Marine Learning Center, focusing on marine conservation, preservation and protection, neatly dovetails into the philosophy underlying the conversion of the Presidio. Vast opportunity exists to coordinate research and educational programs with future tenants at the Presidio.

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1 Creating a Park for the 21st Century, Draft Management Plan Amendment, Presidio of San Francisco, National Park Service, page v.

More particularly, the National Park Service has actively participated in this scoping study and many issues being faced at the Presidio also apply to Fort Mason. The Presidio requires an extensive parking management policy which will influence one for all of Fort Mason. Opening of the tunnel under Fort Mason will benefit the Presidio as well as Fort Mason. The National Park Service envisions Fort Mason as a "hands on" activity center with the Marine Learning Center as a key component. Administration support for these functions could be housed at the Presidio. The restoration of wetlands at Crissy Field could be an on-going study program and exhibit at the Marine Learning Center. The excursions by water from the Marine Learning Center to the natural coastline of the Presidio is a real possibility.

Conclusion

Given the multiple players with broad ranges of interests, devising the supportive and non-duplicative program for the Marine Learning Center will take some time and effort. With the conversion of the Presidio and passing of the Comprehensive Conservation Management Plan there has never been a better time to establish a Marine Learning Center. With renewed interest in the waterfront, existing marine related groups require a supportive place to coordinate programs. The Center can capitalize on these regional influences by having a unique niche;

...to stimulate interest, increase knowledge and promote active protection, conservation, and preservation of the world's oceans by focusing on the environments of the San Francisco Bay Estuary and local Marine Sanctuaries.

PHYSICAL CONTEXT

The San Francisco Bay Area has been a popular destination for a long time. Unparalleled scenery of fog shrouded hills, rising city skylines and ocean vistas have inspired both poet and entrepreneur. Today the region struggles to balance the demands of ever-growing metropolitan regions and the delicate bay system that provides its sustenance.

San Francisco Bay Area

The San Francisco Bay system is known as the largest embayment on the west coast of the United States. Water from the Sierras and the Central Valley drains through the Sacramento-San Joaquin Delta into the Bay covering some 1,620 square miles. The Bay/Delta basin is a recent geological phenomena, only 10,000 years old, when the rising seas filled the Sacramento-San Joaquin river basin. As glaciers reached their present size, 5,000 years ago, the estuary waters were only 25 feet lower than today's level.

Changes due to metropolitan development in the last 125 years have been significant, and public concern for the health of the Bay has reached an all time high. As the importance of wetlands and marine environments becomes better understood, both residents and visitors to the Bay Area are demanding better information, policy, experiences and education regarding the local ecosystems.

Metropolitan growth in the region since the 1850's has been dramatic. Currently 7.5 million people live in the twelve surrounding estuary counties. Additionally, upwards of 8.5 million people visit each year coming from all regions of the United States and the world.

Fort Mason

Fort Mason provides an unparalleled context for the Marine Learning Center. Situated between the tourist saturated Fisherman's Wharf, the popular swath of lawn called the Marina Green and the future National Park of the Presidio, Fort Mason is a unique site in the whole of San Francisco.

Fort Mason was established in 1776, when Spain formed the Presidio. In 1932, Fort Mason was designated the San Francisco Port of Embarkation and over 1-1/2 million troops and 20 million tons of cargo were shipped out to the Pacific Arena from it. The area is divided into two basic areas-Upper Fort Mason, high above the water, contains the ceremonial grounds, officers facilities, and housing; Lower Fort Mason, an area of fill on the bay, served as the industrial side of the site. Lower Fort Mason contains the Pier designated for the Marine Learning Center.

The U.S. Congress turned Fort Mason and several thousand acres of California shoreline over to the National Park Service in 1972, to form the Golden Gate National Recreation Area. In 1977, the Fort Mason Foundation opened Fort Mason Center. The general character of Upper and Lower Fort Mason remains consistent with its military use. However, public comment inspired the removal of a significant

portion of warehouses and industrial structures in Upper Fort Mason to create the Great Meadow with spectacular views to the Golden Gate and Lower Fort Mason.

As designed, Lower Fort Mason is a center with a diversified program of free or low-cost activities. Over 40 resident tenants occupy the Center offering a wide range of experiences. The Center also hosts a large number of special events each year with a total number of visitors between 1.5 to 1.8 million people.

Pier One is at the far northwest corner of Lower Fort Mason. It is highly visible from the Marina Green but must be approached through the Fort Mason gates. It is reached by following Landmark Building A to its end. More specific information of the Pier can be found in the "Building Characteristics" section of this report.

A small court prefaces the Pier. A nondescript but historical two-story building frames the west side of the court. This building is considered significant and cannot be removed. However, the wood frame second story addition can be demolished. Potentially, the building could be rehabilitated to capture the spectacular views to the Golden Gate from this location. This building will be available when the National Park Service relocates its maintenance functions.

Lower Fort Mason offers a great deal to a facility such as the Marine Learning Center. Most importantly, it's right on the San Francisco Bay. The utilitarian nature of the site is entirely appropriate for a maritime science center. Furthermore, the following features benefit the formation of the Marine Learning Center:

- The last remaining bit of original coastline along the north side of San Francisco is adjacent to Lower Fort Mason. Potentially, this area could be interpreted by the Marine Learning Center.

- A tunnel exists under Fort Mason linking Aquatic Park and Lower Fort Mason. The condition of the tunnel is uncertain, but a shuttle, MUNI line or other transport service could bring visitors from the Fisherman's Wharf area to the Center through it.

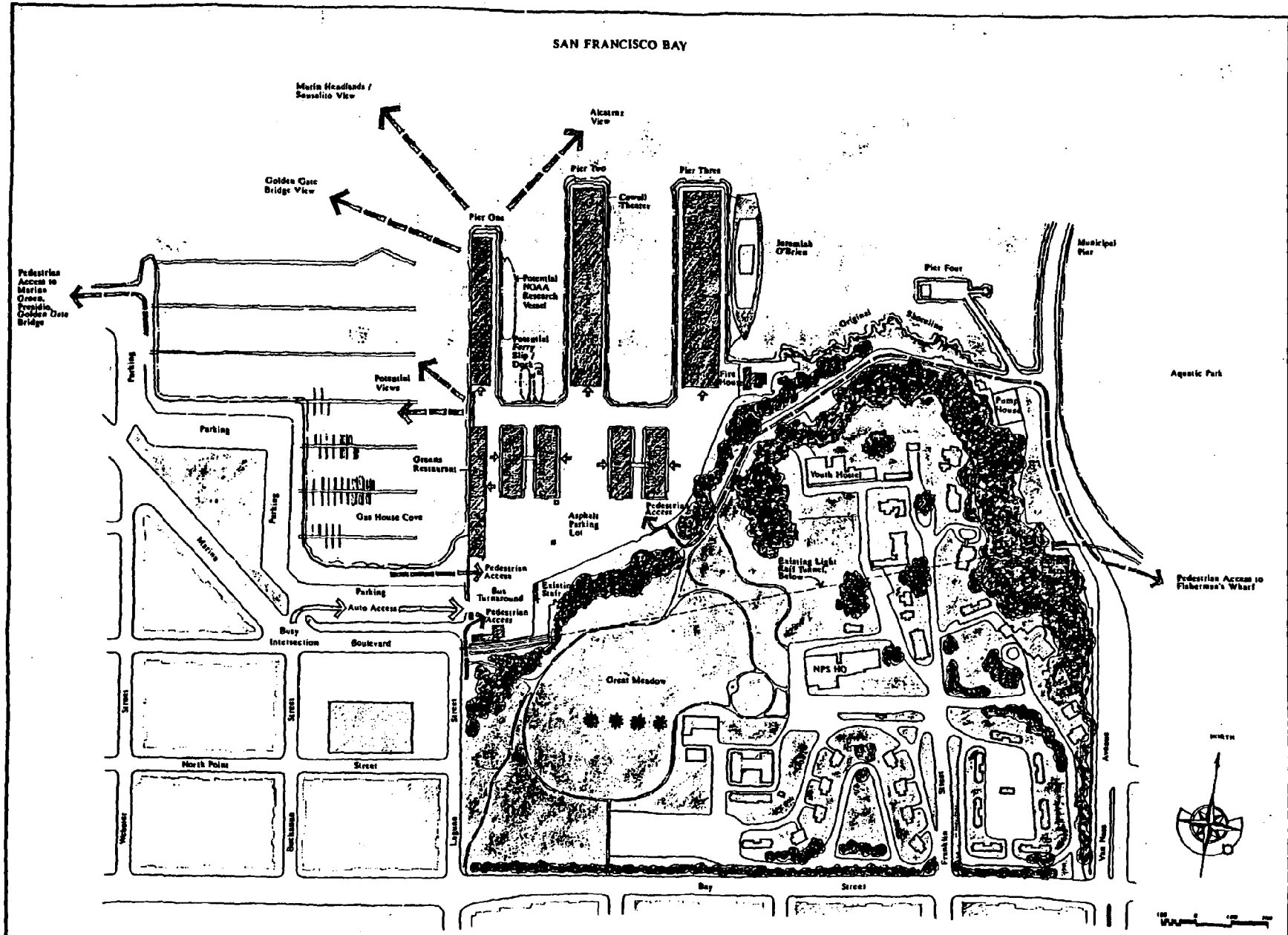
- There is adequate space for a ferry slip in the area between Pier One and Pier Two. The National Park Service is currently discussing the possibility of ferry service to this area with concessionaires. The slip could be used for other vessels besides ferries.

- The site has excellent access from Marine Green and city owned parking spaces.

- The site has pedestrian access from Aquatic Park and the Fisherman's Wharf area. Access will be enhanced once the stairs from Upper to Lower Fort Mason are improved.

- Lower Fort Mason offers many facilities that could be used in conjunction with Marine Learning Center programming, including:

  - Conference and meeting room facilities. (The Fort Mason Foundation has indicated that additional classroom space at the Marine Learning Center would also be welcome.)
  - Cowell Theater with 440 seats in conventional theater format.
  - The Herbst and Festival Pavilions - clear span exhibit and event facilities for up to 5,000 people.
  - Magic Theater and Life on the Water Theater - smaller conventional format theaters.
  - Docking of the Jeremiah O'Brien at Pier Three.
  - Access to 450 parking spaces within the Fort Mason Lot.
  - Access to parking at the Presidio.

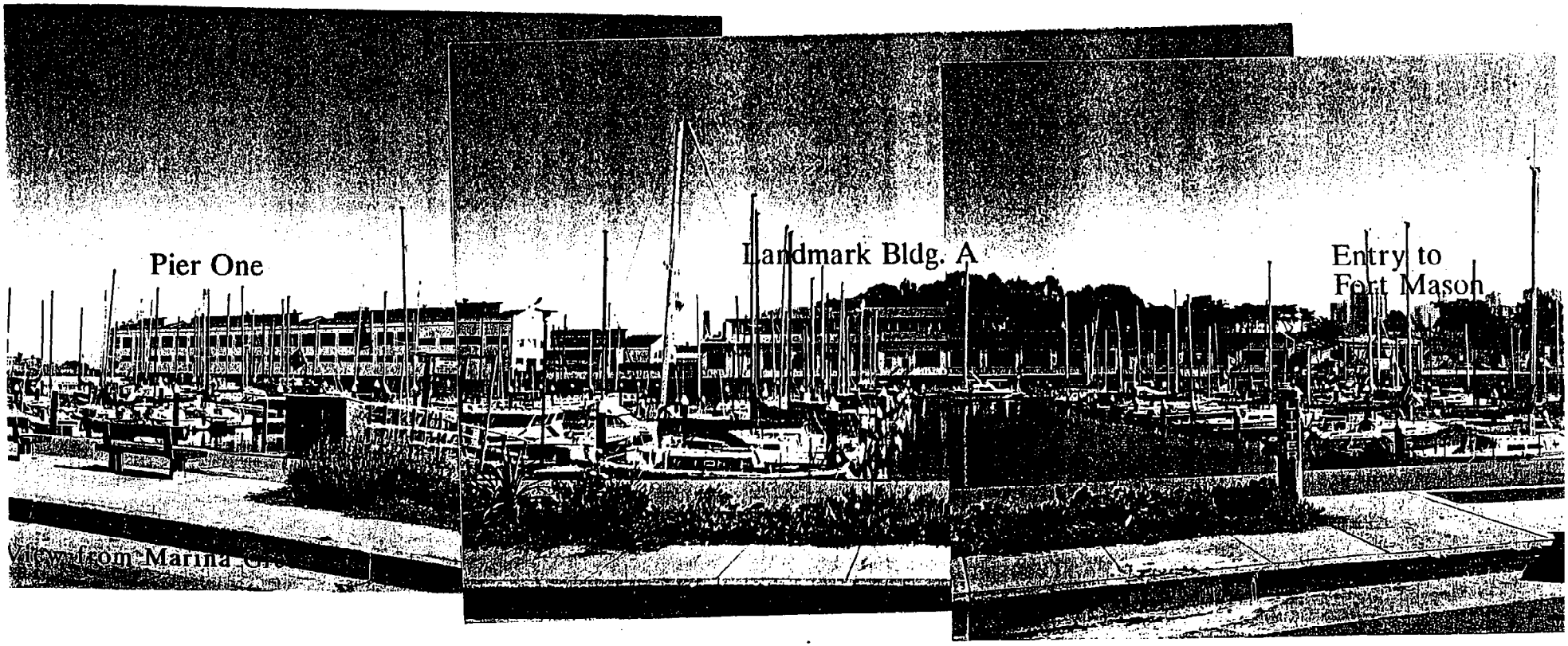


SITE PLAN

BACKEN ARRIGONI & ROSS, INC.

MARINE LEARNING CENTER

NATIONAL FISH & WILDLIFE FOUNDATION


Pier One
Landmark Bldg. A
Entry to
Fort Mason

Entry - Looking down pier apron

BUILDING CHARACTERISTICS

Pier One is 48,710 sf utilitarian warehouse structure at Lower Fort Mason. It is the western-most pier with a single apron on its east side. It commands dramatic views of the entire Bay from the end of the pier and the second level.

The building has a distinctive industrial quality with intact roll-up doors, galvanized steel factory type windows, battered reinforced concrete walls and an exposed structural system. The clear height at the ground level is 18' ± to the underside of the metal floor deck and 18' ± to the bottom of the exposed metal trusses on the second level. Clerestory windows light the ground level. Enormous windows and a roof monitor flood the upper level with daylight. Functioning fire doors and a 3-ton hoist divide the second level.

Some existing terra cotta tile walls remain but most of the walls are temporary wood or chain link partitions. Parts of the upper level have been converted into offices and the National Park Service uses the building for storage and maintenance functions.

History of Pier One

The history of the site at Lower Fort Mason dates back to Spanish occupation in 1776. Subsequent to the Spanish occupation the decision was made in 1908 to locate at Lower Fort Mason "a national pipeline" for material and personnel bound for the Pacific. Construction of the pier deck at Pier One at Lower Fort Mason was started in 1909 and completed in 1912. A temporary wood frame pier shed was constructed on Pier One in 1917. In 1934 the temporary wood frame pier shed was demolished and the existing concrete and steel structure was completed in the place of the previous pier shed. The facilities at Lower Fort Mason, of which the piers were the primary element, were built by the U.S. Army Corp of Engineers at Lower Fort Mason to consolidate in one location the Point of Embarkation for personnel and material destined for the Pacific. Lower Fort Mason was classified as the San Francisco Port of Embarkation in 1932. Lower Fort Mason served this purpose, which was to be its primary purpose, from 1909 to 1945. During this period the specific functions that occurred within Pier One were: 1) storage, 2) radar school, 3) machine and wood shop.

Historical Guidelines[1]

a. 1980 General Management Plan for the Golden Gate National Recreation Area
b. Secretary of Interiors Standards for Rehabilitation (36 CFR 67)
c. Cultural Resource Management Guidelines, NPS-28 (1985)
d. National Park Service Management Policy (1988)
e. San Francisco Port of Embarkation Historic Structure Report (HSR), February 1991

1 San Francisco, Port of Embarkation, Historic Structure Report, Architectural Resources Group, February 1991.

The General Management Plan (GMP) is the National Park Service's planning document and guides all development in the park. Like a comprehensive plan for a city, the document outlines uses for each area, provides architectural direction and provides general goals for the park. The 1980 GMP refers to Pier One as being the potential new home for a Marine Learning Center.

The Historic Structure Report is intended to provide an overall guide to the maintaining the character of Lower Fort Mason. A preliminary plan review with the NPS indicates that this is an appropriate new use for Pier One. The primary document to be used for historical guidelines on the rehabilitation of the building at Pier One is the Secretary of the Interiors Standards for Rehabilitation. The requirements of NPS-28 are contained within the Secretary of Interiors Standards, and National Park Service Management Policy deals primarily with management of the facility.

The Historic Structure Report provides guidelines for the following:

- Building Interiors: Recommends that an inventory of original features be done. Generally, interiors are utilitarian in design and any modification will be expected to maintain this character. Original interior doors and terra cotta tile walls may be sensitive to removal or alteration.

- Bituminous Roofs: The roof of Pier One should remain generally free of penetrations. Mechanical equipment will be expected to be kept within the building. The roof is recommended to be replaced. Further study into the history of the radar school located in the Pier is encouraged, and the existing radar equipment should remain.

- Exterior Concrete Walls and Elements: All repairs should replicate the original form and texture of exterior walls. Lumber marks should be imprinted on fresh concrete patches. New paint should match existing.

- Windows: The galvanized factory type steel windows are to be retained. Figured wire glass can be replaced with clear glass to provide a view to the outside, but extent of replacement is limited. Original glass panes are to be retained on-site.

- Roll-up Doors: Doors should be kept, but it is acceptable to place new storefront windows and doors behind them.

- Lighting: The HSR provides guidelines only for exterior lighting and requires new lighting to be similar to replicate historic fixtures and be installed in the same locations.

- Signs: Any original signs placed by the military should be retained. New signs should be compatible with the spartan character of Lower Fort Mason but should not mimic original signage. Small scale temporary signs and directional markers are appropriate.

Applicable Codes[1]

a. Uniform Building Code (1991, ed.)
b. State Historic Building Code
c. Americans with Disabilities Act Guidelines, Title III (July 26, 1991)
d. National Fire Protection Association - NFPA 101
e. National Electric Code (NEC)
f. Uniform Mechanical Code (UMC)
g. Uniform Plumbing Code (UPC)
h. California Building Standards Code (CCR - Title 24)
i. San Francisco Municipal Building Code (SFBC)
j. Uniform Code for Building Conservation (UCBC)

Federal legislation and NPS policy clearly stipulate that as Presidio buildings undergo rehabilitation, attempts shall be made to meet the nationally accepted model building codes to the maximum extent feasible. This policy is assumed to pertain to the structures at Fort Mason.

Compliance with the nationally accepted model codes (state and local codes included) does not automatically trigger a complete code upgrade. *Alternative criteria do exist* for alterations and historic buildings which provide for flexibility of code interpretation. Typically existing buildings may have their existing use or occupancy continued provided the building met code requirements at the time of construction, and alteration or continued use is not dangerous to life. However, any change in occupancy classification *usually* triggers a full code upgrade for an existing structure. The current California state code applicable to historic buildings allows changes in occupancy without mandatory conformance with new construction requirements, provided the new use or occupancy does not create a fire hazard or other condition detrimental to the safety of the occupants or fire fighting personnel.

Cursory review of the preliminary design of the Marine Learning Center indicates that egress from the single pier apron will not be a problem. Elevators will need to be added to improve disabled accessibility. New disabled accessible facilities, such as bathrooms will be required. Handrails will need to be added to the pier apron.

Structural Issues - Current Status of Pier Repair:[2]

Approximately $1 million was recently allotted for repair and reconstruction of Piers at Lower Fort Mason. Only 20% of the scope of work was completed before the allotted budget was spent. There are 135 individual concrete caissons supporting the pier deck at Pier One. Of the 135 caissons, 28 were identified and scheduled for repair, and of

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1 San Francisco, Port of Embarkation, Historic Structure Report, Architectural Resources Group, February 1991, appendix D & Guidelines for the Rehabilitation of Buildings at the Presidio of San Francisco

2 Brenda Mihalko, NPS liaison for pier repair construction at Lower Fort Mason, telephone conversation 12/3/93.

the 28 scheduled for repair only 11 (39 %) were repaired. The 28 piers scheduled for repair were classified as being in a "Level 4" condition, where approximately 4"-5" of concrete depth is spalled off and rebar is exposed and corroding. Part of the work to be done on Pier One included repairing the underside of the concrete pier deck, where concrete is badly spalling and rebar is exposed and corroding. The plans called for shotcreting over these areas. Similar work was completed on Pier Three, however in this case the damage was more extensive and required replacing and splicing in of new rebar, as well as, reforming new concrete. Pier One was not felt to require this type of extensive repair at this point.

The government already has plans underway to get funding in the next 2-3 years to complete the repair work on the piers. This pier repair work is expensive. Underwater divers are required, and the cost of underwater labor is high. The work also needs to be coordinated with the tides, which adds time and money. The average cost of repairing the caissons in the worst shape was $20,000 - $30,000 per caisson. One caisson cost $100,000 to repair. It is now felt that $4 million would have been necessary to complete the project.

Recommendations of Structural Report

Construction and Repair of Facilities Damaged by the Loma Prieta Earthquake at Lower Fort Mason, San Francisco, California, Moffat & Nichol, October 1990.

a. Roof Live Load: The roof is adequate to take the design live load of 16 psf.
b. Second Floor Live Load: Floor members were checked and found to be adequate to support design loads of up to 125 psf uniform load and 3000 pounds concentrated load, enough for light storage, exhibit and assembly.
c. Wind Loads: Structure adequate for 70 mph design wind loads.
e. Seismic Loads:

V=0.183 W (UBC 1988)
V=0.233 W (NAVFAC P-355)
Seismic Loading governs over Wind Loading.

f. Findings: The following findings of the report are based on assumptions of material strengths and a limited knowledge of the construction of the building, where drawings do not provide the required information:

1. Roof Monitor: The Roof Monitors have walls composed mostly of glass and have no lateral force resisting elements, therefore additional bracing is recommended for the roof monitors. (Note: The glass at the roof monitors may need to be replaced with tempered glass, or wired glass, for safety reasons).

2. Roof Diaphragm: The existing Roof Diaphragm is inadequate for transferring seismic forces to the shear walls in the transverse direction. Additional lateral braces should be added at Roof Diaphragm.

3. Floor Diaphragm: The shear strength of the metal deck diaphragm is uncertain and may not be adequate. Horizontal bracing may be required under the second level end bays parallel to the west side longitudinal wall.

4. Steel Moment Frames in transverse direction: The steel moment frames are too flexible. There are two options for strengthening these walls; 1) Adding new cross bracing to steel columns at window bays of east and west walls at the first floor, and 2) Infill three windows at each side at the first floor level with concrete and reinforcing bars.

5. Concrete Shear Walls in the Longitudinal Direction: The concrete shear walls are under reinforced according to the UBC 1988 code. One option is to infill part of the windows at the south end wall, providing extra shear capacity to the structure.

Other Building Characteristics

The building is noninsulated and is very cold during winter months. To comply with historical requirements, it is desirable to keep the concrete walls and ceiling structure exposed and thus noninsulated. Temporary space heaters are currently used. A more efficient heating system is recommended. It is almost certain that all building systems; electrical, plumbing, telephone, and mechanical, will need to be upgraded or replaced. The existing sprinkler system should be tested and a new system be considered.

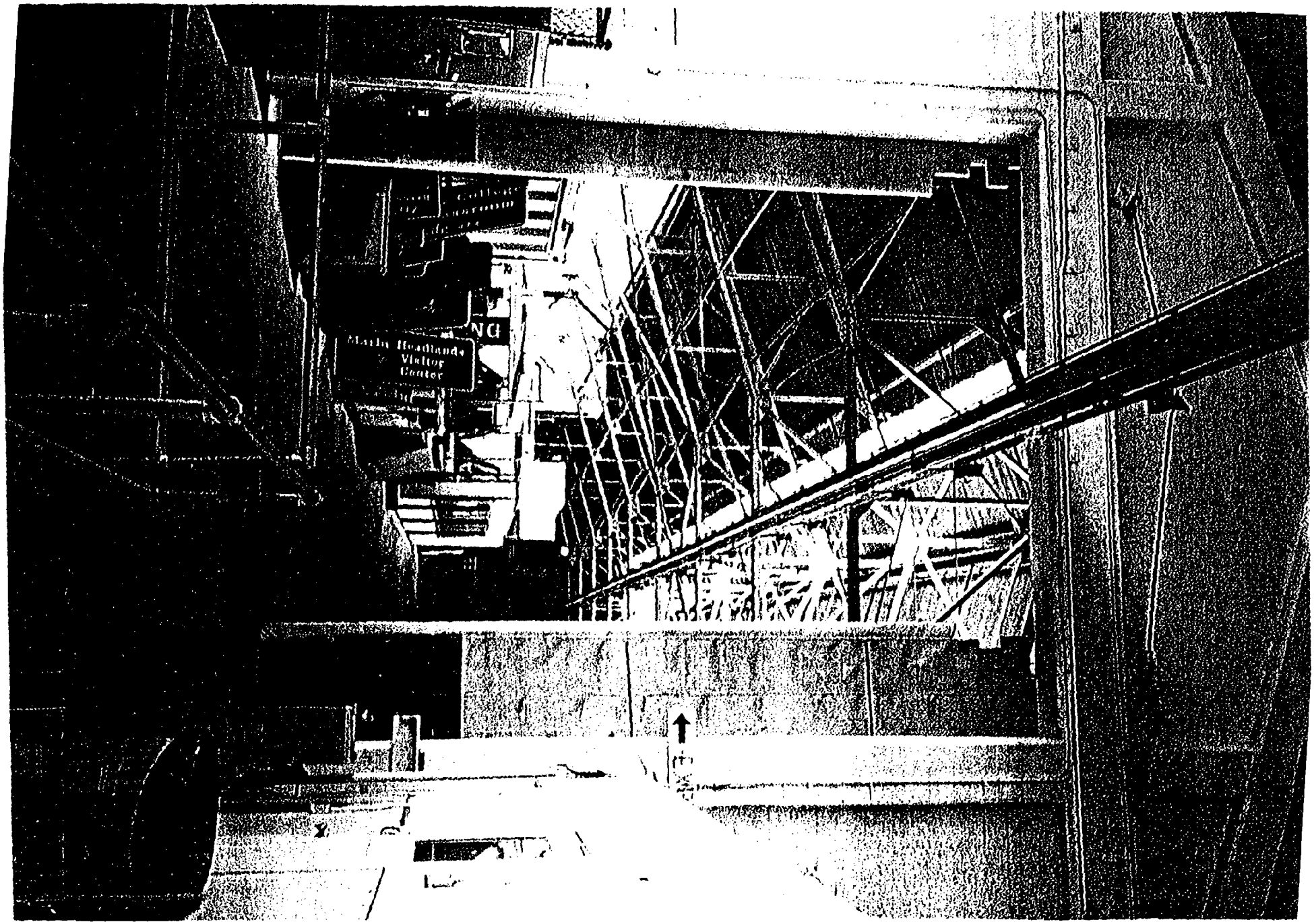
A hazardous materials survey should be undertaken. Details from the original drawings indicate the possible presence of asbestos and a certified hazardous materials consultant should be retained to determine the extent of it. Lead paint is likely. Where otherwise stable and encapsulated hazardous materials are disturbed by new construction, abatement procedures will be required.

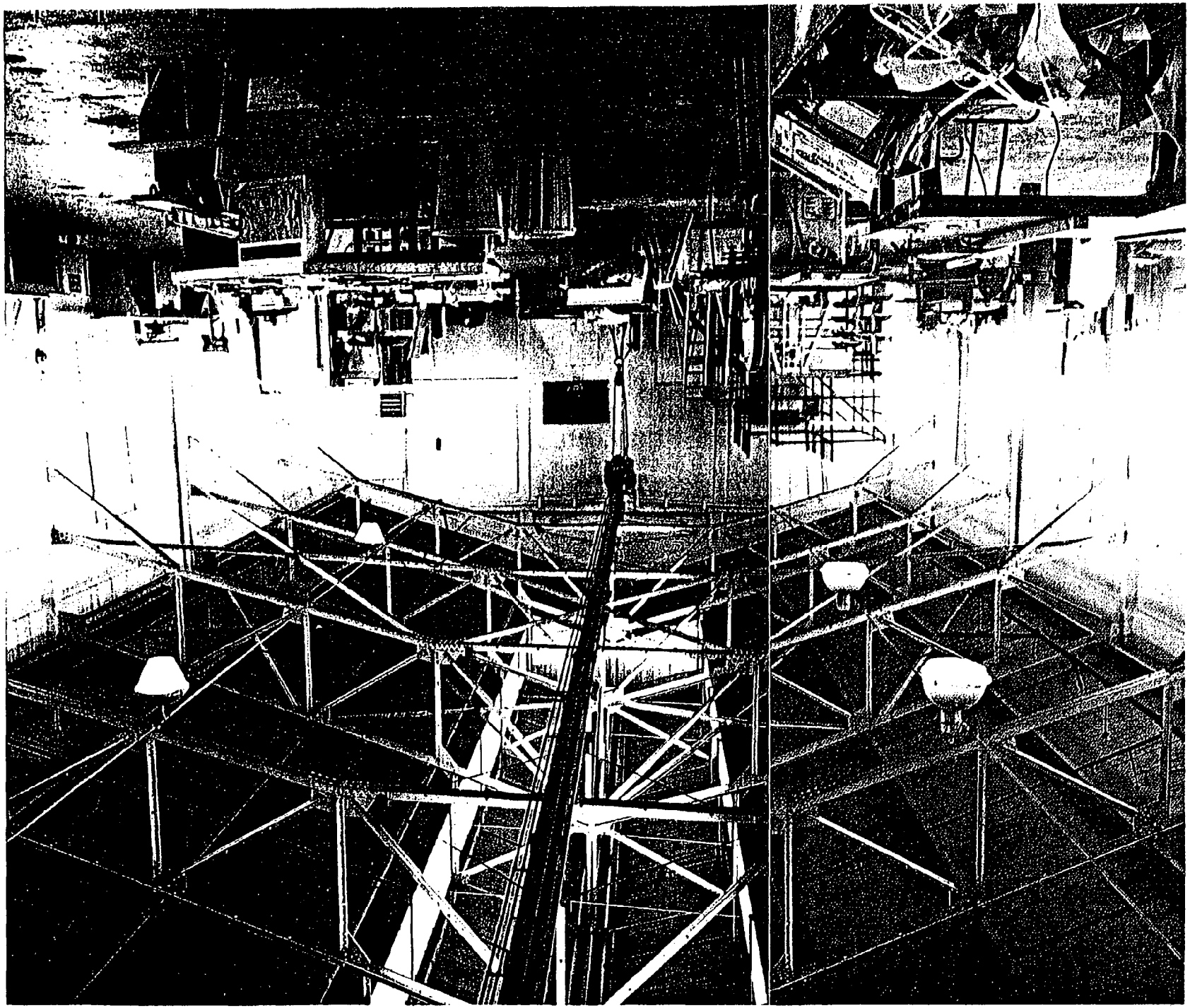
Conclusion

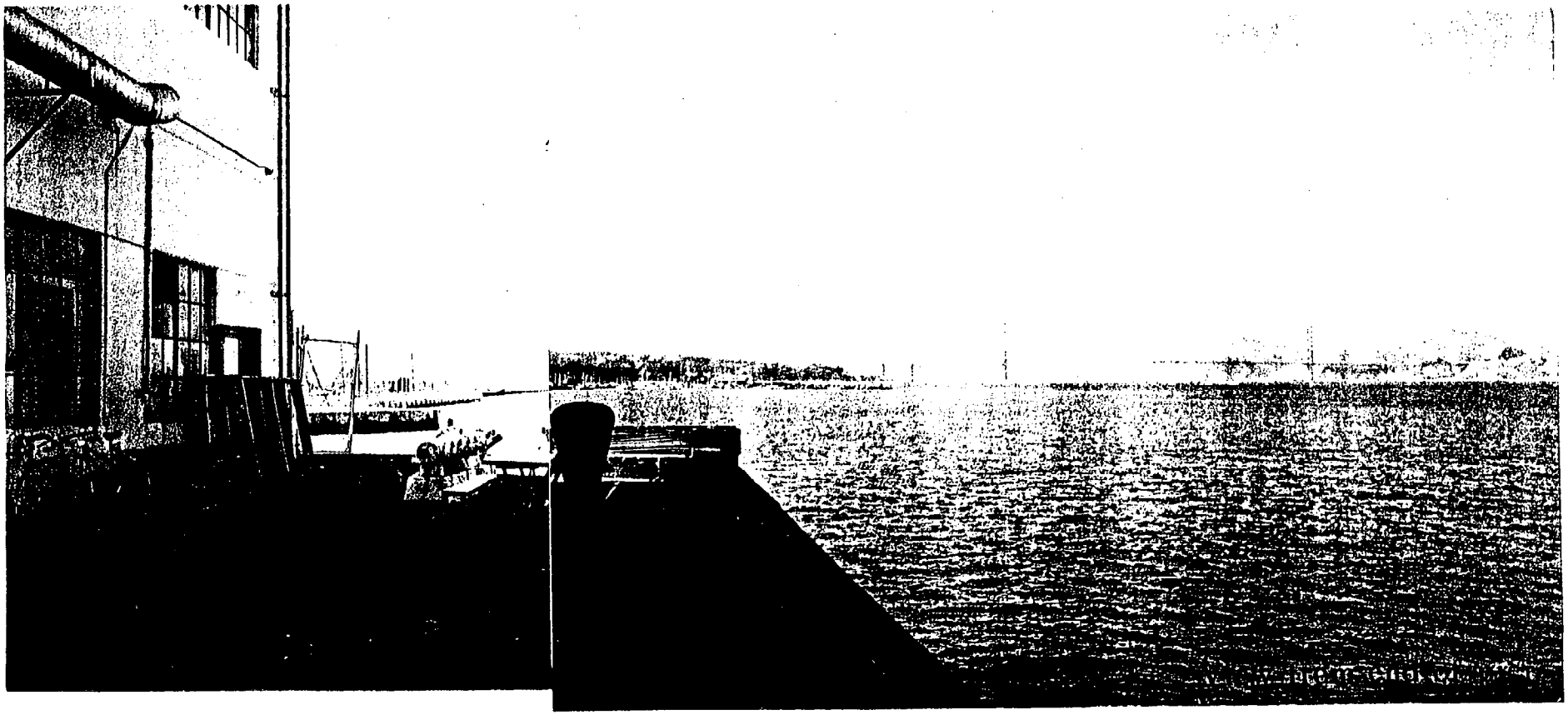
Overall, Pier One is an outstanding building to consider for the Marine Learning Center. Other than the allocation of the funds, there are no obvious physical obstacles to developing Pier One as the Marine Learning Center. The dramatic open spaces on the second floor are ideal for exhibit spaces. The pier and exterior appearance are perfect for the type of uses envisioned and the maritime nature of the future facility. The building will need structural and building systems improvements to realize the vision of the Center, but existing architectural features are a decided asset. It would be impossible to construct this same building today under current codes. Every effort should be made to capitalize on the building's architectural qualities, its outstanding location and its history.

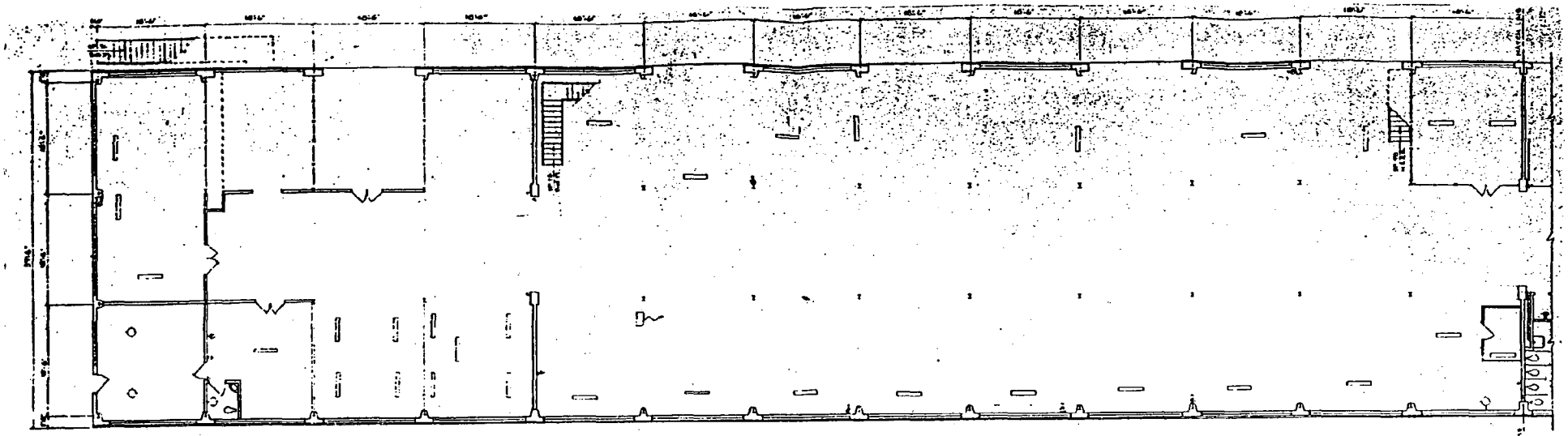
DANGER

DANGER
LOOK OUT
FOR CRANE
Lower level

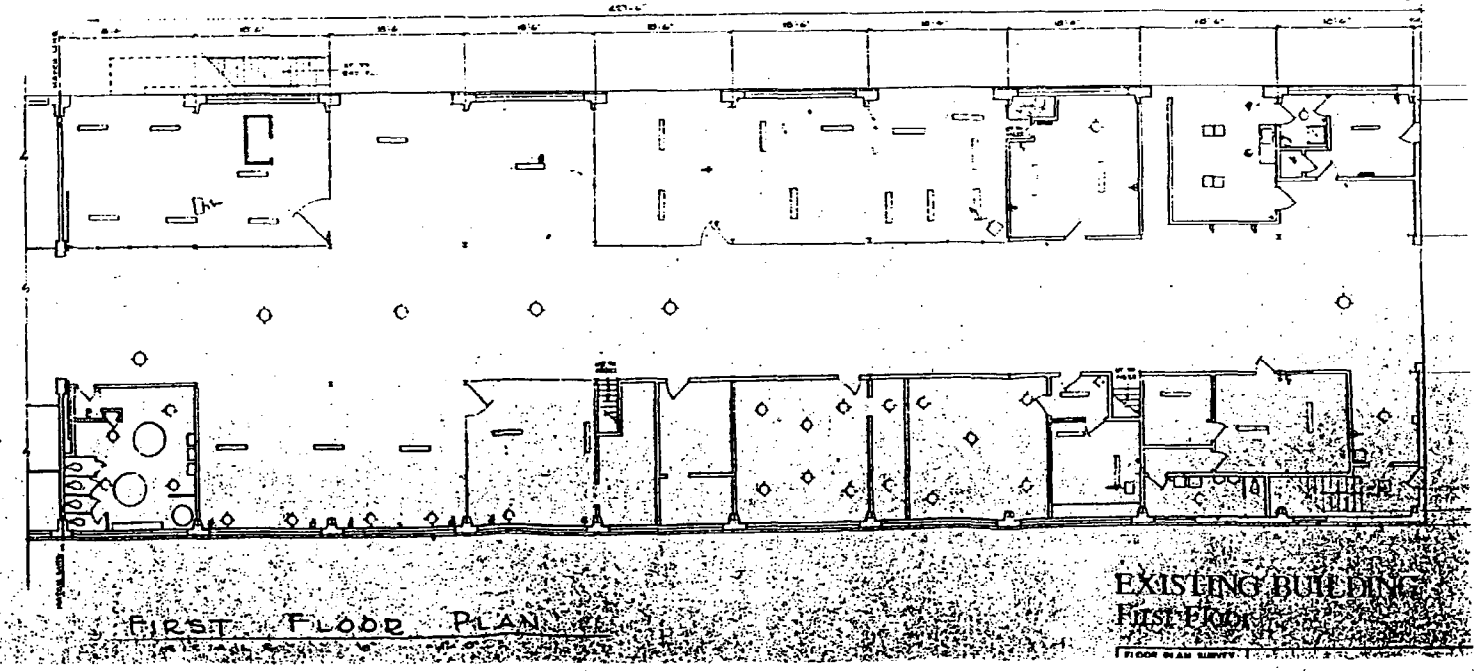

Visitor
Center





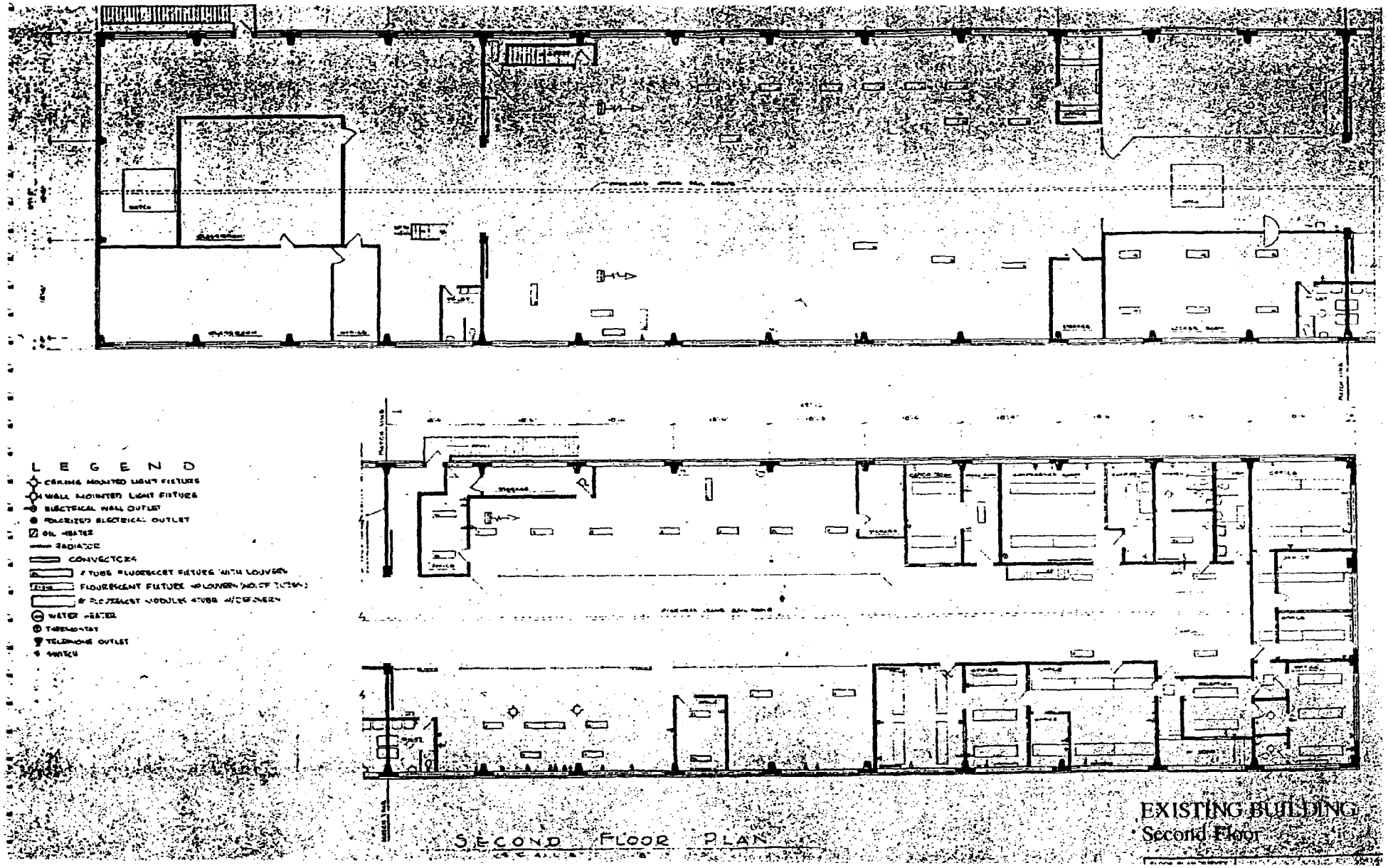


L E G E N D



FIRST FLOOR PLAN

EXISTING BUILDING
FIRST FLOOR


LEGEND
CEILING MOUNTED LIGHT FIXTURE
WALL MOUNTED LIGHT FIXTURE
ELECTRICAL WALL OUTLET
POLARIZED ELECTRICAL OUTLET
OIL HEATER
RADIATOR
CONVECTOR
WATER HEATER
THERMOSTAT
TELEPHONE OUTLET
SWITCH
SECOND FLOOR PLAN
EXISTING BUILDING
Second Floor

MODELS FOR THE MARINE LEARNING CENTER

The Marine Learning Center will be a unique facility in the San Francisco Bay Area. Although existing and proposed facilities address certain marine related issues, the Marine Learning Center will address the issues of marine conservation, protection and preservation in a comprehensive manner. In particular, the Marine Learning Center will exhibit specific characteristics of the Marine Sanctuaries Program. Several science centers were studied to gain further understanding of successful display techniques, development of mission statement and the practicalities of rehabilitating an historic structure.

There are many wonderful facilities to use as a models for the Marine Learning Center. Both the *Pier-One - Marine Learning Center Feasibility Study*, September 1993, by the State Coastal Conservancy and the attached analysis by Economics Research Associates, in the appendix of this report, analyze comparable institutions for programmatic and economic characteristics. In addition to the facilities listed in these reports, three others deserve special study; the Sea Center in Santa Barbara, the Bay Area Discovery Museum, and the NASA Space Center in Houston.

The Sea Center in Santa Barbara

The Sea Center in Santa Barbara is a small-scale, highly successful facility with notable educational outreach programs. It is approximately 2,400 square feet, including the Touch Tank located on the pier. Approximately 65-75,000 people visit, while 4,000± school children attend classes and field trips each year. The philosophical concept of the architecture is an "underwater stroll" with walls painted dark steel blue, a full use of the volume of the building to indicate marine depth, with models of marine fauna overhead. The facility lacks classroom storage and exhibit development space and cannot expand due to building restrictions of the historic pier location.

The City of Santa Barbara manages the center through the Natural History Museum. Sales and admissions provide operating revenue in addition to donations from NOAA, oil companies and other parties.

The following exhibits from the Sea Center provide useful information for those of the Marine Learning Center.

Model of Santa Barbara Bay: This exhibit had limited educational value and was not interactive. Although useful for orientation, the model could be improved by adding fiber optics to locate oil platforms or film projections to show the extent of historic oil spills.

Marine Environment Information with Computer Display: For a relatively low cost, several computer programs were developed to provide factual information using a mouse and push button format. Unfortunately, computer technology becomes

outdated or non-functional quickly. The information provided is interesting to 10-12 year-olds up to adults or approximately 40-50% of the visitors.

Model of Animals: The full-size models of marine mammals are very popular and are used to discuss related topics. However, the taxidermy mounts do not present the appropriate preservation message. The model of the whale ($80,000± made in Monterey Bay Model shops by Andy Anderson) is especially popular and provided media exposure for the Center when it was installed.

Tides and Weather: Under development, this exhibit will relay information regarding current Bay conditions to the Center. Potentially, this exhibit will successfully combine interactive information retrieval to current research efforts.

Revolving Exhibits: The Sea Center has a small amount of wall space for changing exhibits. Shows are mounted for 3 months.

Touch Tank: Developed at the cost of approximately $140,000 the Touch Tank is the focal exhibit of the Center and a key to the Center's continued success. The tanks allow visitors to handle creatures directly, see the current conditions of the Bay water and ask questions of attending docents. There is also a simple seating structure and panel for children's artwork. The exhibit is outside and takes advantage of views to Bay and Pier for teaching.

The Pier: In addition to the Touch Tank, the Center mounts information panels to surrounding Pier.

Back-of-House Space: Tours are often taken through the aquarium support area. Children enjoy these "real" experiences very much.

Aquariums: The aquariums at the Sea Center are very small but engaging. Ideally, aquariums would be closed-system environments as those developed recently in Monaco.

In additional to exhibits, the Sea Center has developed an outstanding multi-lingual, multi-cultural program called Los Marineros, directed at elementary school children. The program has been very popular and includes in-school study and curriculum, field trips to the beach, bay and pier, and teacher training.

The Bay Area Discovery Museum, Fort Baker

The Bay Area Discovery Museum concentrates on educating children through entertaining activities. The facility is spread between several existing structures and one new building. Attendance is estimated at 105,000 the first year, with typically 120,000 visitors per year. The target audience is elementary school children.

Located on an historic site like Pier One, the Bay Area Discovery Museum is a successful example of historic rehabilitation within the Golden Gate National Recreation Area. On the outset, the Bay Area Discovery was required to state that they would be suitable for a historical property, and that they could coexist with historical character. It is important to the National Park Service that one would be able to see the buildings in an "historical site" that looks more or less as it originally did during a designated Period of Significance. Exterior details were very important, and the NPS was more sensitive to historical accuracy than State and Federal requirements demand. Since the exterior was well rehabilitated, the National Park Service allowed some latitude on interior. Architects were expected to bring the buildings up to code wherever possible but were instructed to maintain the aesthetic characteristics and historic integrity of the architecture.

The Bay Area Discovery Museum is required to do a plan review with NPS every time repairs or alterations are proposed. Federal property is not required to be inspected by local authorities, and the Federal government is not equipped to do inspections. Potentially, the NPS will be negotiating an arrangement with City of San Francisco to do review work and inspection work for projects on the Presidio, and new GGNRA work in San Francisco, including Fort Mason. Structural engineers brought museum buildings up to current codes.

The Bay Area Discovery Museum found it difficult to remove original walls. Walls that had been added over time became a research problem, as to whether they had historic value and need to be kept. Existing conditions were extensively documented prior to demolition. NPS allows "temporary" constructions on exterior of historical properties. "Temporary" is defined as being able to be completely removed in three days.

The construction cost of the Bay Area Discovery Museum was $5 million± for 25,000± square feet. Costs were close to the equivalent of new construction.

The Bay Area Discovery Museum is a private non-profit organization with 60% of operating revenue coming from admissions. The remainder comes from grants, donations, etc.; typical for science centers of this kind. Discovery Council raises half of the remaining 40%. The cafe breaks even, and the store covers itself, and makes small profit of $10,000±.

NASA Space Center

The NASA Space Center, near Houston, Texas, promises to be highly successful financially, and is an interesting example of large science center. Deemed "the closest thing to space on earth," the Space Center draws extremely high visitation, considering its remote location.

Planned to be mainly an entertainment facility, the Space Center educates visitors on the fundamentals of the space program through a series of interactive, high-tech

exhibits. The whole facility is 183,300 square feet, and contains both an IMAX and Iwerks theater system. Attractions include equipment and mockups for children to play on, exhibits on "what's new out in space," and other corporate sponsored exhibits. Tram tours to Johnson Space Center run regularly.

Enhancing the visitors' experience are retail and restaurant components. The gift store has a large inventory of specially designed products based on the exhibits. A two-tier dining facility serves both those who want a sit-down dinner and those who prefer a quicker meal. Price ranges for separate dining experiences.

The facility specializes in dramatic spaces. A voluminous multi-use space ties all the separate attractions together and is popular as a rental space for special events. Within this space, a large video screen announces special events to the visitors. Video is extensively used to enhance the high-tech image of the space. Spaces are carefully designed to assure smooth flow of people from one attraction to another. Key to the success of the attractions is the high level of interaction between the staff and visitor.

Conclusion

Numerous successful science centers could serve as a model for the Marine Learning Center; the Sea Center, Bay Area Discovery Museum and NASA Space Center are only three of these. The Sea Center, a comparatively tiny facility, efficiently uses its spaces to best advantage and augments exhibits with a exceptional educational outreach program. The Bay Area Discovery Museum is an award-winning museum, in rehabilitated historic buildings, with innovative exhibits using play to educate children. The NASA Space Center educates visitors using state-of-the-art technology and entertainment systems. Most notably, the success of each of these is dependant on the mission each facility professes, the target audience, and unique blend of education and entertainment their programs demonstrate.

BUILDING PROGRAMMING

Potential Components - the "Kit of Parts"

The building components listed below, and illustrated in the plans prepared by Backen, Arrigoni and Ross dated 1/24/94, represent a preliminary "Kit of Parts" that a Marine Learning Center at Fort Mason could conceivably contain. It is not a definitive building program. This "Kit of Parts" is based on the research and input in this preliminary phase of work and will need to evolve and become more definitive as the project moves into its next phase.

Interpretive Space/Exhibit - "Exploratory Experience"

The exhibit component is the fundamental basis of the Marine Learning Center program. As the mission of the Center is to inspire people to learn about marine issues and then encourage activity participation in the marine protection, conservation and preservation, the exhibits and architectural space will echo and reinforce this vision. The purpose of the exhibit space is to engender a rich engaging and entertaining space in which people learn.

The first space the visitor experiences is the **Sea Stair Hall.** In this area, people come to understand the concepts of the Center's mission. The Sanctuaries and Reserves Program is introduced. Here visitors gain an overall and general picture of the region and the numerous elements and organizations that influence the marine environment. An inspiring stair leads a visitor from the darkened lower entry hall to the sublime sunlit space of the upper level. A magnificent replica or skeleton of a whale dives along the length of the stair, breaking the division between first and second level just as it would the surface of the water.

The Stair Hall leads into the **Great Hall.** This upstairs volume, skylit from above with large industrial windows, high ceilings with steel trusses overheard and an existing 3-ton hoist running the length of the space, is perfect as a multi-media interactive exhibition space. This is a space to be explored. An array of media takes visitors beneath the waters to see the wonders of these sanctuaries and reserves. The exhibits might include touch tanks, interactive video connected to remote cameras, glazed tanks, taped video displays, printed material, cased and uncased artifacts and live demonstrations. Knowledgeable staff circulates, relating details and stories to the visitors.

A demonstration/lecture area frames one end of the Great Hall overlooking the exhibits. Regularly programmed events invite visitors to learn more about specific aspects of marine and estuary systems.

The **Pier End** closes the inside exhibit area by inspiring people to continue exploration out in the Bay. The views from this north end of the Pier span from the Presidio to Alcatraz. Here revolving exhibits bring marine environments of the world to the MLC; the Great Barrier Reef of Australia, the Keys of Florida, and other Marine Sanctuaries. Because of its flexible nature, this area could be fashioned to

accommodate travelling exhibits from other institutions. This spectacular location is a fitting place for opening receptions and catered events.

The **pier apron** takes the visitor closer to the Bay by making the pier itself an exhibit. It is possible to begin an "under pier walk" off of the apron taking people down to the caissons to see marine life at the tide line. A NOAA research vessel is moored at the pier with regular tours. Excursions out into the Bay by ferry or other organizations originate near the pier apron, taking people from their orientation at the MLC out into a real world experience.

Theater

The theater component supports the experience of the exhibit component. It can be used in conjunction with the exhibit space, or separately. It is composed of an Iwerks theater and its pre-function lobby.

The **Iwerks Theater** is a 100 seat state-of-the-art film theater using large format films in a patented design to achieve an extremely high quality video and audio experience. The theater would be used to supplement the experience of the interpretive exhibits by taking the visitor on a near real life trip into the undersea world. The theater is constructed so that the viewer's peripheral vision is filled, making the movie into a sensory experience.

The **pre-function lobby space** would be a multi-purpose space located at the end of the pier on the First Floor, preparing the visitor for both the show in the Iwerks Theater and a visit to the research vessel docked at the pier. This space is a resting point at the end of the interpretive exhibit sequence. A refreshment bar could be located here and will enjoy the spectacular views to the Bay before continuing on to the theater, or the tour of the research vessel. The pre-function space and the theater could also be leased for special events, or used in conjunction with receptions occurring in the revolving exhibit space directly overhead on the second floor. A separate entry from the pier is provided so that these spaces at the end of the pier can be accessed separately from the exhibits when they are being used for special events after hours.

Loading

The loading component is needed for receiving and distribution of exhibits and exhibit materials for the various components of the center, including the Learning Center, the Gift Shop and the Theater Pre-Function space. The loading component is centrally located on the first floor of the pier for ease of access from the pier by delivery trucks and to the various components served. An opening in the ceiling, similar to openings that exist in the building, is provided so that materials can be lifted by the existing 3-ton hoist on the Second Level up to the exhibit spaces. The primary component of the loading area is open high ceiling storage / work space with light from clerestory windows above. A small lockable receiving office is provided on a mezzanine.

Learning Center

The Learning Center, also supports the exhibit space, and is intended to be used for educational programs in conjunction with the Center, as well as for programs independent from the Center. Programs specifically for school children from varied cultural backgrounds would be designed by the Learning Center. The Learning Center is composed of research, library, classroom and computer center components, and is accessible from both the interior of the Marine Learning Center and directly from the pier via its own separate entry.

The **research component** is envisioned as a interactive wet lab classroom containing sinks, microscope stations, and storage cabinets. The space provided is on the First Floor with 17 ft. high ceilings and high windows for natural light, and is located directly adjacent to the loading area for ease of material access, and communication with the exhibit component. Children would be encouraged to "play" in this area, learning about the marine world by active participation in real research projects.

The **library component** contains book, audio and video stacks and other reference materials on the Sanctuaries and Reserves Program and related environmental issues and activities. A small reading room is provided at the center of the space with tables and chairs and a comfortable seating group. The space is located on the First Floor with 17 ft. high ceilings and high windows for natural light, and is between the computer center component and the research component for combined usage.

The **computer center component** contains several personal computing stations, as well as storage and restrooms for supplemental use relative to the research, library and classroom components of the Learning Center. A desk is provided for a staff person in the computer center to monitor both the use of the computer center and the library. Because these two spaces are both quiet uses, they are open to one another and monitored in conjunction. This area would be a place for individuals or small groups to explore detailed information gathered from the local marine environment.

The **classroom component** contains six classrooms in a variety of sizes with a central lobby space and storage. The classrooms are simple rooms with tables and instruction boards intended to supplement the other lecture and demonstration spaces provided within the facility and Fort Mason. The classrooms are generally smaller than lecture areas and simply furnished to allow for a variety of uses. Classroom space is on the first floor with 17 ft. ceilings and clerestory windows in the large classrooms against the exterior walls.

Entry

The entry contains the ticketing desk for the Marine Learning Center and its related functions, i.e. The Iwerks Theater and the Research Vessel tour. Open space for circulation is provided between the front doors and the ticketing desk to allow for queuing. The entry is located on the first floor at the south end of the pier. The ticketing desk is immediately in front of the visitor upon entering. The front desk is a pavilion or kiosk illustrated with exciting graphics, freestanding within the 17 ft.

high ceiling open space of the entry. The entry space is open to and surrounded by the gift shop. The front desk will also serve as the point of sales for the gift shop.

Gift Shop

The gift shop is seen as containing the typical range of gifts and products found in a science museum, many of which would be developed specifically for the Marine Learning Center. The displays would be distributed within the larger volume of the main entry space, and would serve to animate the large industrial space of the main entry, creating a dynamic space and a high exposure for the retail component of the project, as visitors would be passing through the gift shop on their way in and out of the Marine Learning Center. The gift shop and the main entry would be flooded with light from both high clerestory windows and large storefront windows to be provided in the large existing floor to ceiling openings.

Restaurant

The restaurant is an approximately 130 seat dining restaurant and bar with a cafeteria component. Designed to serve both the Marine Learning Center visitors and the general public. The menu of the restaurant is tied directly to the MLC educational programs.

Visitors pass through the **bar** to the dining area. Situated at the very south end of the Pier, the bar seating is directly over the main entry and capitalizes on views across Fort Mason towards the City.

The bar, kitchen and **primary seating** areas are in the airy steel trussed volume of the second level. Tables are placed to take advantage of the spectacular views of the Bay, Golden Gate Bridge, Pacific Ocean, and on a clear day, the Farallon Islands. Existing roof monitors provide daylight from above and those dining overlook the central stair space. The restaurant will have a casually elegant character enhanced by the industrial windows, trussed and existing architectural elements, similar to other locally successful San Francisco restaurants; Greens, Zuni Cafe and Lulu's.

Marine Learning Center - Program
Pier One, Fort Mason Center

1. Interpretive Space / Exhibit		**20,700**	**sf**
Stair Hall	7,300 sf		
Great Hall	6.320 sf		
Pier End Hall	3,100 sf		
Demo./Lecture	2,200 sf		
Other / W.C.	1,780 sf		
2. Theater and Pre-Show		**6,829**	**sf**
Iwerks Theater	2,168 sf		
Pre-show	3,100 sf		
Other / W.C.	1,561 sf		
3. Loading		**2,222**	**sf**
4. Learning Center		**7,752**	**sf**
Classrooms	3,320 sf		
Multi-Media	1,100 sf		
Library	2,200 sf		
Research	1,132 sf		
5. Entry / Circulation		**1,454**	**sf**
6. Gift Shop		**3,390**	**sf**
7. Restaurant		**6,363**	**sf**
Restaurant	5,250 sf		
Loading	350 sf		
Entry / W.C.	763 sf		
TOTAL PIER ONE		**48,710**	**sf**
8. Administration (Bldg. E)		5,200	sf
TOTAL		**53,910**	**sf**

If the restaurant is not included as part of the Marine Learning Center,

TOTAL 47,547 sf

ECONOMIC CRITERIA

The concept of a Marine Learning Center at Fort Mason has been discussed for well over a decade. Although the primary concept has remained more or less consistent, actual program and management strategies have varied widely. Most recently, the State Coastal Conservancy presented three scenarios for the Marine Learning Center, the largest of which was 21,000 square feet. None of the schemes were financially self-supporting.

An important part of this scoping study was to determine if a Marine Learning Center at Pier One could be self-supporting, and what facility programming would be required to do so. Preliminary findings indicate that the establishment of a dynamic, educational and entertaining center could indeed be financially feasible and the building offers rare opportunities for the development of the Center.

However, the self-supporting aspect of the Center is dependent on several important criteria including:

- **The average length of stay be one and a half hours.**
- **The facility and exhibit program are of superior quality.**
- **The MLC will be entertaining as well as educational and feature a "high impact" film and many interactive exhibits with broad age appeal.**
- **The MLC will be aggressively marketed including cross promotions with the Exploratorium, California Academy of Sciences and other science-oriented attractions in the San Francisco Bay Region.**
- **The entire building be utilized, and administration space be allocated in Building E or elsewhere**
- **Public transportation, including school buses, will be available to transport approximately half of the visitors to the MLC.**
- **Adequate on-site parking will be available during peak attendance periods.**
- **The MLC will have various educational programs for school groups.**
- **Admission fee will be an average of approximately $3.50.**
- **No debt service for the development of the facility will be required.**

Visitation

The majority of the operating revenue for a Marine Learning Center is determined by several interrelated variables; admission price, length of stay and visitation. Visitation generates most of the income for a science center and people will pay more for longer and more enriching experiences. This amount of time in the facility, the *length of stay*, has a direct influence on how far people will travel to reach the center. Generally, people will want to spend at least the same amount of time in the facility as they take to get there. Therefore, length of stay also determines the distance which visitors will travel. Distance of travel defines the boundaries of the "catchment area" for visitors; the demographics of the catchment basin determines how many people may be expected.

Admission Price

Market analysis of any science center is difficult in the early phases. However, given that the vision for the Marine Learning Center is described as a "dynamic, educational and entertaining experience", it was determined that an average admission price of $3 to $5 was reasonable.[1] For this cost people would expect to visit the center for about an hour and a half. Given the catchment basin of population within an hour and a half, it is possible that the Marine Learning Center could have a maximum visitation of about 600,000 people. Therefore, a conservative estimate of visitation would be in the 400,000 to 500,000 range.

Size

There is no one way to determine the size of exhibit space needed to interest people for a certain length of stay. An attraction of very limited size could hold visitor interest for a long period of time, such as a conventional movie theater; a large facility with expansive displays could do the same. A study of comparable facilities indicates that approximately 20 sf/visitor to 60 sf/visitor is normally dedicated to exhibit space. The Monterey Bay Aquarium allows 36 sf/visitor, half way between the upper and lower range. As the nature of exhibits varies, so does the square footage required per visitor. At least 10,000 sf is required for exhibit space to provide a comprehensive interpretation of issues and almost double that to encourage a significant length of stay. Science centers similar to the Marine Learning Center dedicate a range of 20,000 to 22,000 sf to exhibit space.[2] The building configuration of Pier One can accommodate approximately 20,000 sf for both temporary and permanent exhibit space. This space will provide an hour and a half visitor length of stay.

Thus, in summary, we estimate that the Marine Learning Center at Pier One could attract 450,000 visitors, charging an average of $3.50 for an hour and a half stay.

Operating Expenses

Operating expenses associated with a science center such as the Marine Learning Center vary widely depending on the type of programs offered, the amount of people employed, the type of exhibits displayed, and the type of facility. Conceptual operating cost estimates can range from $34.26/sf[3] to $46.38/sf.[4] Operating costs

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1 Comparable adult admission prices in the Bay Area: The Exploratorium - $8, the California Academy of Sciences $6, Bay Area Discovery Museum - $4, San Francisco Zoo - $6.50, Marine World $23.95.

2 Science Center Planning Guide, Association of Science-Technology Centers, Victor J. Danilov, 1985, p. 26. Average of small science center statistics.

3 ASTC/CIMUSET Directory, 1993. Derived from statistical profile of "Small" science centers.

4 "Attendance Potential and Economic Performance of the Proposed Marine Learning Center at Fort Mason, San Francisco", Economics Research Associates, January 1993, p. 11.

include employee expenses (salary, benefits, and taxes), rent, insurance, maintenance of facility, retail store operations, and general management expenses. Operating expenses do not include funds for new exhibits and the development of new programs. Given the size of the Marine Learning Center at 47,547 sf (42,347 sf in Pier One and 5,200 sf administrative space in Building E), operating expenses could range from approximately $1.8 million to $2.56 million, including costs for capital improvements. Operating expenses for the restaurant are not included.

Operating Revenue

Science centers commonly depend on admissions, retail sales, food service, special events, facility rental, and other sources (investments, memberships, educational programs, etc.) for income. Generally, facility components that generate the most revenue will be exhibits (through admission revenue), the gift shop, the restaurant, the theater (especially if IMAX, Iwerks, or OmniMAX format) and rental of the facility for special events. Although critical to the mission of a science center, components such as classrooms, laboratories, and attractions with high maintenance costs often do not produce net revenue. Given that the Marine Learning Center be self-supporting, facility programming must emphasize revenue generating components that provide an experience that is simultaneously entertaining and informative.

In order to be self supporting, covering operating expenses and generating money that can be ploughed back into new exhibits and programming, preliminary financial analysis of the Marine Learning Center indicates that the restaurant, gift store, theater, and rental of the facility will generate revenue of approximately $900,000. Admission and other sources would need to generate the remaining $1 million to $1.7 million. At an average admission price of $3.50 the Marine Learning Center must attract 375,000 to 540,000 visitors, well within the parameters of the population catchment basin.

If the length of stay and the distance travelled by the visitor are relatively fixed at one and a half hours, then the visitation level and importantly, the level of revenue derived from admissions is a function of *admission price*. Any increase in price generates a substantial increase in revenue. After reviewing a wide range of comparable facilities, a quite conservative admission price of (av.) $3.50 was chosen. It should be noted that when the MLC has established itself in its own particular "market niche", there may be opportunities to raise admission prices and thereby generate higher levels of revenue.

In addition, "Attendance Potential and Economic Performance of the Marine Learning Center at Fort Mason, San Francisco", attached in the appendix, indicates that *visitation* rates also have the potential to be higher. To obtain higher visitation, the Marine Learning Center must incorporate aggressive management policies and program coordination to assure continued interest in the center. Visitation will tend to drop over time if new exhibits, films and programs are not developed. However, higher visitation plus higher admission could contribute to an enhanced financial picture.

Science centers of this type and size typically obtain support from corporate, foundation and individual donors that accounts for over 50% of income; the remaining revenue required to cover expenses is generated by admissions and other sources within the facility. The extent of potential corporate or foundation support is very difficult to estimate at the early conceptual stage, therefore no assumptions have been made about the extent to which this represents a viable source of income. Since the preliminary financial analysis presented above indicates the Marine Learning Center can be self-supporting based on admission and other revenues, additional income from other sources could serve to enhance the facility, expand the outreach of educational programs and provide additional revenue to Fort Mason Center.

Construction Costs

At this conceptual level, it is difficult to develop a comprehensive construction cost analysis. However, since the building is structurally stable and the interior improvements will be designed in a utilitarian manner[1], a cost to develop the Marine Learning Center is estimated in the range of $13 million. The highest costs of the facility would be the exhibit areas. High quality interactive exhibits cost between $300 to $400 a square foot. The restaurant and theater would each cost between $1.6 to 1.7 million to build. (If the restaurant is run by another tenant, this cost could be removed from the total for the Marine Learning Center. The remaining areas, site improvements, fees, pier upgrades and contingency factors account for the balance.

Conceptually, a cost estimate would include:

Exhibits (includes improvement for temp. exhibit space)	$4.0 million
Iwerks Theater	$1.7 million
Restaurant	$1.6 million
Learning Center	$0.8 million
Gift Shop (does not include inventory)	$0.4 million
General Building Improvements (seismic upgrade, mech. systems, disabled access, interiors, etc.)	$2.0 million
Other Costs (fees, bond, contingency, etc.)	$2.5 million
TOTAL	**$13.0 million***

* Caisson repair will also have a cost. At this time, it is assumed that the National Park Service would need to make the repairs regardless and would provide the funding.

1 As per National Park Service requirement to comply with the Secretary of the Interior's Standards for Rehabilitation.

Example Economic Analysis

The attached example illustrates the relationship between operating costs and revenue but is not meant to be a final business proforma.

The operating expenses have been broken down to include insurance, maintenance and miscellaneous costs based on comparable facilities[1]. Employee expenses were figured on having approximately 30 people to operate the facility. Theater and gift store expenses are based on revenue generated by these components.

As shown by the example, revenue is highly dependent on the amount of people that attend the facility. Admission fees earn most of the revenue. Revenue from the gift store and theater is directly tied to visitation. The success of the restaurant is also related to attendance.

The example is useful to study the connection between costs, revenue and visitation variables. To earn more in admission revenue, the Center will need to draw more people or raise admission fees. To do so, the Center may need to strengthen education components (hire more people), contract more unusual films (greater theater costs) and improve exhibits (capital improvements). The resulting greater attendance also funds improvements. It also causes an increase in gift store, theater and maintenance costs. however, operating costs do not rise as fast as revenue from increased visitation.

Conclusion

To be successful financially, the Marine Learning Center will need to balance the amount of people visiting and the admission they pay, with costs being a dynamic ongoing facility that continually attracts people.

The development of a Marine Learning Center at Pier One appears to be financially feasible, based on the assumptions listed at the beginning of this section. Further study of the program will help to refine economic analysis and construction costs. Exhibits need to be designed and their marketing appeal tested. However, given that the Marine Learning Center would be a dynamic educational and entertaining facility, it is possible for it to be self-supporting.

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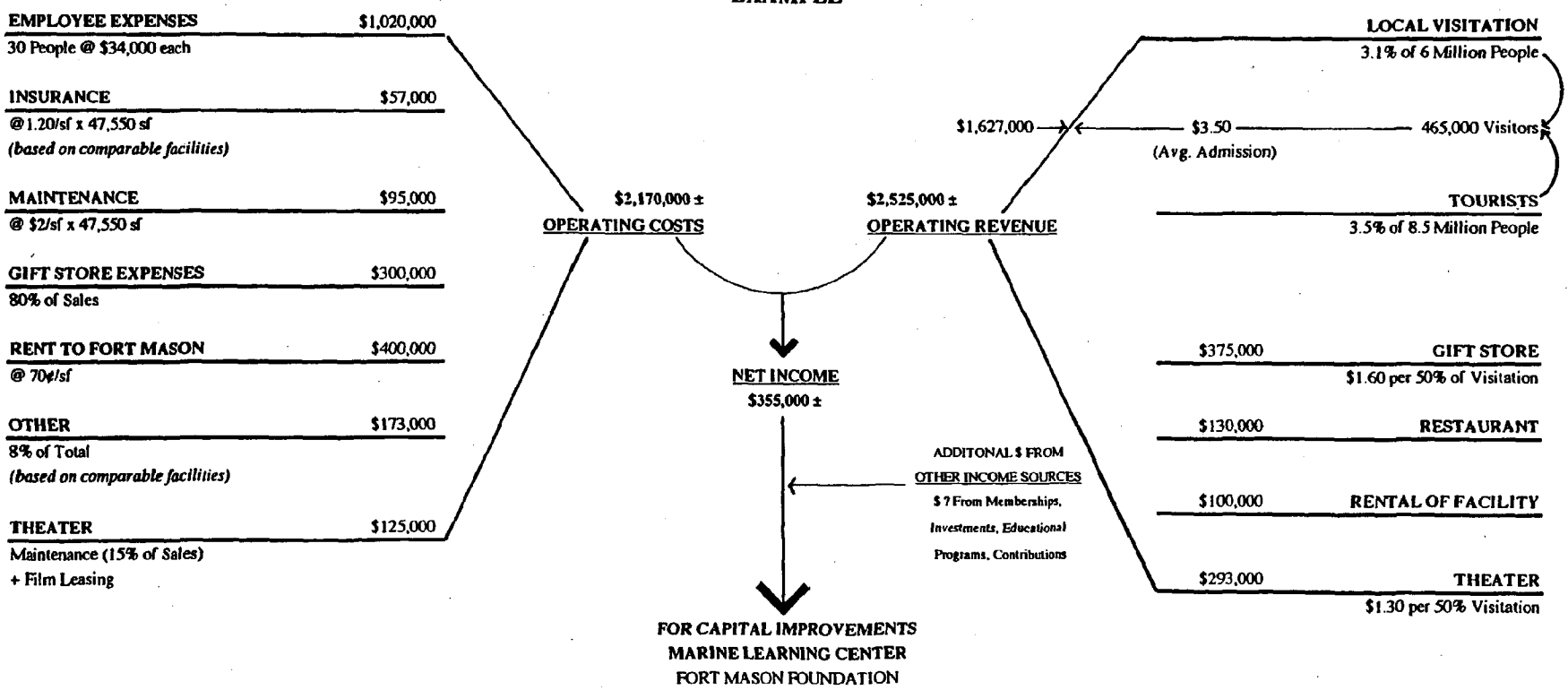
[1] Pier One - Marine Learning Center, Feasibility Study, State Coastal Conservancy, September 1993, page 47.

ECONOMICS - MLC PIER ONE

EXAMPLE



COMMUNITY SUPPORT

At the time of this report, discussions were on-going with the Fort Mason Foundation and the National Park Service. Generally, the concept of a Marine Learning Center is viewed as very favorable and supportable by both groups.

The Fort Mason Foundation

The Fort Mason Foundation has viewed Pier One as their "endowment" and has anticipated developing funding for capital improvements through its use. Pursuant to that idea the Foundation developed tenant improvement plans for Pier One in 1991. Proposed resident (i.e. tenant) groups were not to impact existing Fort Mason activities and added classroom spaces were to enhance existing conference center, to be managed by Fort Mason Foundation. The following spaces and issues were discussed as part of the 1991 plan:

- Marine Center (8,500 - 13,000 sf) would be dominant resident group. Rental is $.70/sf (16 cents higher than other resident/tenants)
- Proposed restaurant would be open 7 days and later hours than Greens (the one other restaurant at Fort Mason). It would be charged a higher percentage, (5%) and cater special events. It would not be a destination restaurant, but would be intended to provide informal dining based on a walk-in cliental.
- Additional people visiting Fort Mason, due to development of Pier, would be 150,000 to 200,000 people.
- Operating costs would be paid by FMF at $100,000 - 200,000 a year.
- Based on borrowing $2 million to do capital improvements, and repaying that over 7 - 10 years.
- Attracting a variety of residents would spread the financial risk . Any piece could fail and not jeopardize Fort Mason Center.
- With a shuttle, Fort Mason could accommodate visitors parking remotely. However, the Fort Mason Foundation did not have specific figures for additional parking required or additional visitation expected.

The Fort Mason Foundation supports the concept of a "marine ecology center" being located at Pier One. Discussion with the executive director indicated that his view of a marine learning center should have a variety of exhibits: history of the Bay, illustration of atmospheric conditions and a sampling of Bay ecology. He believes that the focus of the facility would be on children and senior adults. A research vessel could be docked at Pier with excursions to the Bay. The purpose of the Center would be to expose people, get them interested and out to explore the area; similar to a classical visitor's center. Children would arrive by bus. It would not be a prohibitively expensive project, charge little admission, and be locally run, founded and oriented. Facility would be at the end of Pier.

The idea of using the whole of the Pier for a marine learning center has been discussed with the Fort Mason Board of Directors. Economic, space and impact issues were addressed in a series of meetings. Generally, the concept of using the entire pier is viewed favorably. Currently, there is no place on the bay where 400-500 people can congregate; the MLC is seen as a great opportunity. The Fort Mason Board recommended that the following issues be explored and addressed:

- **Management of Pier One** should be coordinated with input from the Fort Mason Foundation to eliminate confusion with special event scheduling. Other tenants schedule special events through the Fort Mason Foundation and the Marine Learning Center could do the same. Also, the MLC could allow Fort Mason all management of special events scheduling of the facility.

- **Parking** issues should be studied further. Currently, Lower Fort Mason does not control or limit the parking lot in any manner. Also, Fort Mason does not have data on parking but does check informally for commuter parking. The executive director has indicated that he believes that the parking lot is already at capacity. Given the conversion of the Presidio, it is likely that Fort Mason will need to initiate a traffic management plan soon. The Foundation will probably begin running a shuttle along Marina Green in the near future. Current parking availability includes approximately 450 spaces in the lot inside the gates and access to the city-owned lots on the Marine Green.

  Visitors to the Marine Learning Center will require up to 155 parking spaces. The Fort Mason Foundation is concerned that the additional visitors could cause access problems for current users, mainly the large-scale special events. Impact of increased use of Fort Mason could lead to loss of revenue, as groups could be discouraged from using Fort Mason if access became more difficult.

  Although visitation to the MLC is uncertain, an example of parking requirements is attached based on the attendance example from the "Costs and Proforma" section. The example is based on a peak day. The requirements would actually be somewhat lower if visitors already attend other events at Fort Mason were subtracted from the total attendance.

  Several parking mitigations are available to Fort Mason. Further study is required to assess the feasibility and full benefit of each of these measures:

  - The Fort Mason lot inside the gates could be restriped adding as much as 50 spaces.
  - The Fort Mason lot could be metered, controlling the time people stay and earning revenue.
  - The Fort Mason lot could gate the entrance with a control arm and ticket booth, discouraging commuters and earning revenue.
  - Ferry service could reduce the need for visitors to drive to the facility.
  - Shuttle service through the tunnel to Aquatic Park would reduce the need for visitors to drive to the facility.

- Fort Mason could encourage the City of San Francisco to turn over the lot just outside the gates to the Foundation. (95± spaces).
- The city-owned lot just outside the gates could be restriped, adding a significant number of spaces.

- **Income to Fort Mason:** It would be desirable to the Foundation that the MLC assure income to Fort Mason in some form. In the analysis of operating and other costs, rent for the Pier was suggested to be 70 cents/sf as in the Fort Mason 1991 plans for the pier. (Currently, other Fort Mason tenants are charged 54 cents/sf. Every other year rents are raised 4%.) There are concerns that the MLC would not be self supporting and that Fort Mason would have to carry a financial burden.

- **Supplementing facilities within Fort Mason:** It will be important that the theater within the MLC be a special format such as an Iwerks theater, in order to add to the variety of theaters already at Fort Mason. Additional classroom or conference space was felt to be appropriate as Fort Mason had planned to expand their own facilities. It would be important to allow Fort Mason access to these spaces.

It is important to note that no matter how the Pier is developed, with or without MLC, the above recommendations will apply. Management of the rehabilitated Pier will have to be coordinated through Fort Mason. Additional parking will be required for new tenant groups, triggering the development of a traffic management plan. Financial stability of any tenant is always a concern with new tenants. New conference and classroom facilities should augment ones existing at Fort Mason. As any other resident tenant, it is important that the Marine Learning Center be developed in a cohesive manner with the existing Fort Mason fabric.

The Marina Neighborhood

Early conversations with the Fort Mason Foundation and National Park Service have indicated that residents in the adjacent Marina neighborhood would generally be in support of an educational science center at Pier One. The Marina Neighborhood will be concerned about increased traffic and parking problems and will encourage mitigation. After these issues have been studies more thoroughly, it will be necessary to talk with Marina residents further. At the same time dialogue with the City of San Francisco can begin.

The National Park Service

The National Park Service has been represented at all discussions with the Fort Mason Foundation. The Marine Learning Center is seen as a partnership between NOAA and NPS. As the General Management Plan for the Golden Gate National Recreation Area describes a marine ecology center in one of the lower Fort Mason piers, the concept for a marine learning center in Pier One is considered highly appropriate. Furthermore, the use of the pier for a science center is seen as compatible with the structure's historic character. It will be important for the restaurant to tie to the Center's program and not compete with other neighborhood restaurants. The NPS also wishes to assure the Fort Mason Center income by rent through the use of Pier One.

Most importantly, the conversion of the Presidio to a National Park represents opportunities for Fort Mason and thus, the Marine Learning Center. The National Park Service has a strong interest in opening the tunnel, establishing ferry service or water taxi between Fort Mason and the Presidio and developing a traffic management plan for both locations.

It is most important to the National Park Service that funding for the Marine Learning Center be pursued through other channels than those being used for the Presidio. NOAA is seeking to secure funds for the next phase in the next few months and the NPS has offered support in that endeavor. The San Francisco Committee to the Advisory Commission of the Golden Gate National Recreation area has given an "enthusiastic endorsement" of the project.

Congressional Delegation

NOAA and the NPS have already begun to speak with congressional representatives at the National level to engender support for the Marine Learning Center. Congresswoman, Nancy Pelosi, has offered to co-host congressional briefings between the Department of the Interior (NPS) and the Department of Commerce (NOAA) to secure funding. Budgetary discussions are occurring now for fiscal year 1995.

Other Constituencies

Briefings have been held with the Bay Conservation and Development Commission, State Coastal Conservancy and California Coastal Commissions. The project has been received favorably.

It will be important to these agencies that the MLC be unique relative to existing or proposed facilities and effort be made to assure non-duplicative programs. The MLC is seen as potentially very supportive to the programs and interests of other marine related organizations. The help and cooperation of these local agencies will be necessary to the success of the MLC.

PARKING - MLC PIER ONE

REQUIREMENTS		EXAMPLE	OPPORTUNITIES
ANNUAL ATTENDANCE:	465,000	?	FERRY SERVICE
PEAK MONTH:	65,100	?	OPEN TUNNEL
14% OF ANNUAL ATTENDANCE			
PEAK WEEK:	14,700	?	FORT MASON SHUTTLE
(Divide by 4.428)			(To Marina Green)
PEAK DAY:	2,500	50 Spaces ±	RESTRIPE FORT MASON LOT
(0.17 X PEAK WEEK)			
IN FACILITY:	625	?	METER LOT/PERMIT ONLY PARKING
(0.25 X PEAK DAY)			
If 50% in Facility arrived by car (300-325 people) and each car carries 2.6 people, then available parking:		?	GATE LOT ENTRY
	115-125 spaces	90 Spaces ±	CITY-OWNED LOT TO FORT MASON CONTROL
		?	TOTAL REQUIRES FURTHER STUDY

MARINE LEARNING CENTER • FEBRUARY 1994

B.A.R. PROJECT NO. 93106

NEXT STEPS

The goal of this scoping study was to identify insurmountable obstacles to the realization of a Marine Learning Center occupying the whole of Pier One. No insuperable obstacles were found. Pier One is a reasonably sound building with outstanding architectural features; it requires some structural and building improvement. Fort Mason fits as a location for this type of science center. An exciting program for the Marine Learning Center can be fitted into Pier One and will attract a significant audience. It is likely that the Center will be financially stable, and could make a certain amount of money for capital improvements. Local political constituencies appear to view the project favorably.

The development of the Marine Learning Center is a timely endeavor and should continue uninterrupted. A very aggressive schedule aims at starting construction of the facility at the end of 1995 or beginning of 1996. Considering that the building is not yet vacant, Fort Mason and other constituencies have given enthusiastic but conditional approval, the "vision" requires further definition, only a rough cost estimate has been done, and only initial feasibility researched, much needs to be accomplished before the Marine Learning Center can open its doors.

Three fundamental actions need to be completed if the schedule is to be met; a funding plan must be developed for both pre-construction and long term needs; an organizational format and management plan must be established; definitive answers to access problems must be found. These actions, separate but linked, provide a platform for the resolution of all other issues.

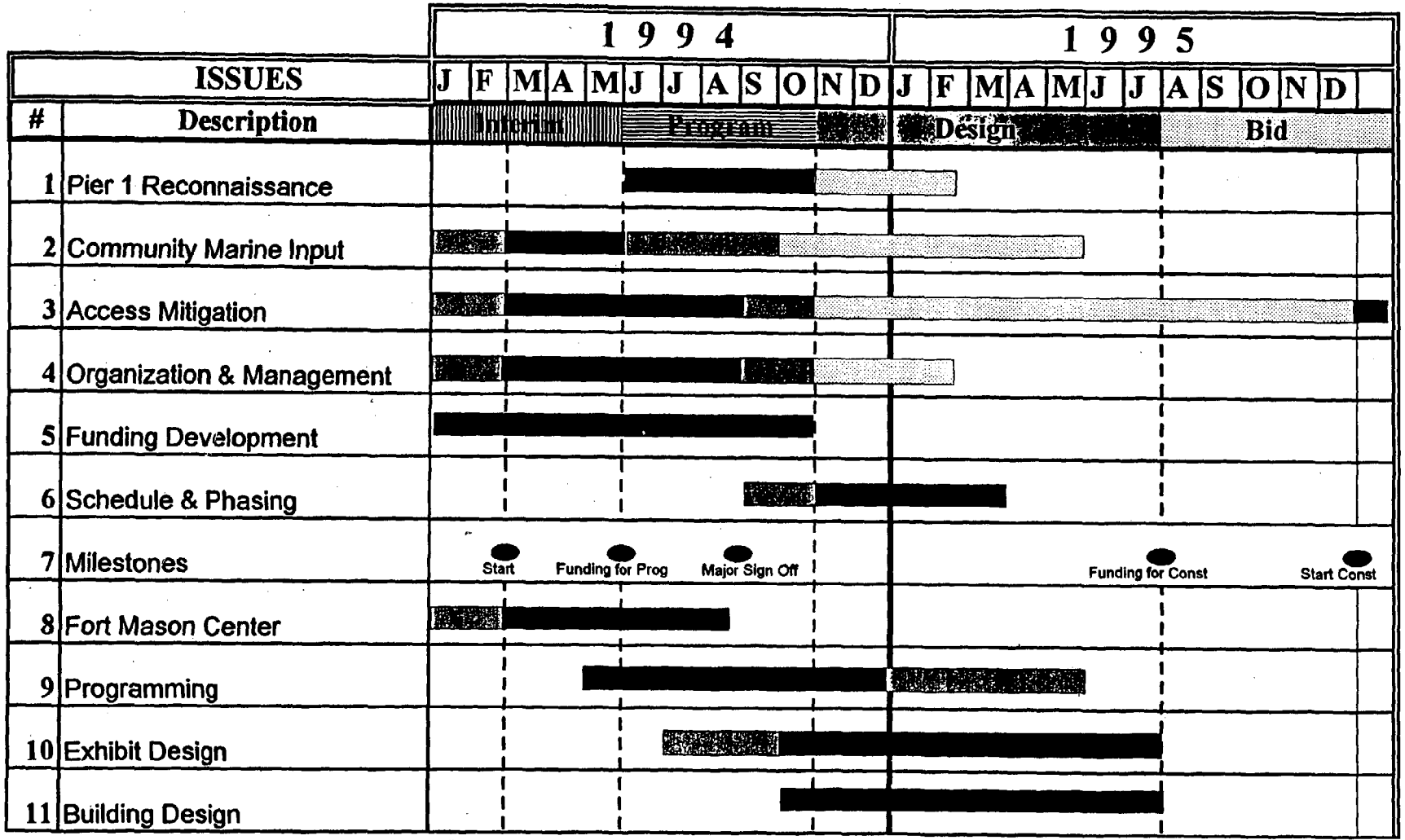
When these issues have been addressed, further programming -- that is the translating of the vision into specifics -- can move forward. Specifically, input from the "marine ecology" community can be solicited, exhibit design can be initiated, the unique niche for the Marine Learning Center can be clarified, and phasing can be strategized.

A schedule has been prepared, working backwards from a desired construction start date of January 1, 1996. There are four basic phases:

- Interim Period - time when NOAA is gearing up, and identifying a project leader for the main body of work.
- Program Period - time when serious work on the definition of "unique niche" is conducted, and exhibit design/technology concepts are introduced.
- Design Period - developing the specific design and working drawings for the building and the exhibits; developing and continually refining cost; moving toward further developing and staffing the organization.
- Bid Period - the last period prior to construction. Documents for bids and the building and the exhibit fabrication and installation are sent to the qualified bidders, proposals are reviewed, evaluated and contracts awarded.

The attached schedule shows the years 1994 and 1995 divided into the above time periods and the key issues that need to be worked on and laid out with time frames and performance milestones.

MARINE LEARNING CENTER DEVELOPMENT SCHEDULE



KEY

Primary Activity Period

Starting or Secondary Activity Period

Concluding Activity Period

1. **Pier One Reconnaissance**

A preliminary walk through of the building was competed for the scoping study, but the structural and building utility systems need additional analysis. The conceptual design presented in this scoping study needs to be thoroughly tested against the constraints and opportunities of building. More precise programming information will refine rehabilitation costs of the building.

2. **Marine Community Input**

There is a wide-ranging universe of groups and organizations doing work and/or conducting programs relating to the marine ecology and environment. Some are research oriented, some are activist, some involve the general public and some do not.

A basic tenet of the Marine Learning Center is that it be *non-duplicative, supportive and have a unique niche.* Supportive means providing a platform to assist existing marine-related organizations and programs. To make sure that the Center is non-duplicative and supportive, which will naturally and inevitably lead to the MLC being unique, the following work must be included:

- Identifying and classifying as many of the groups as possible (the State Coastal Conservancy feasibility study is a good beginning) and developing a picture of their goals, mission, program, focus and scope.

- Identifying what "support" would help them in their mission and discussing what parts of that support could be provided through MLC programs.

- Ensuring that MLC's approach develops synergy.

- Developing a broad-based consensus among these groups on the MLC mission and role.

Typically, smaller non-profit organizations work on a shoestring. They tend to be wary of any new player -- especially a large government agency -- concerned that they may be overwhelmed, lose resources, etc. In the interim period those fears need to be overcome by bringing them into the process early, demonstrating that the MLC will be a benefit and identifying specific things the MLC can do to create community synergy.

3. **Access Mitigation**

The Fort Mason Foundation Executive Director has expressed vigorous support for the MLC, tempered by some real concerns about the parking and traffic impacts that might be generated by a facility the size of MLC.

Very little data exists about traffic and parking patterns, utilization and trends at Fort

Mason. However, anecdotal evidence suggests that at peak periods – generally defined as those weekends where major facilities at Fort Mason are rented to an exhibitor, convention or fair -- the parking lot immediate to Fort Mason is full. It is hypothesized that the addition of a major MLC without any attempt to mitigate these problems could lead to reluctance on the part of the large exhibitors to continue renting space at Fort Mason. These large exhibitors represent a substantial proportion of FMC's revenue.

To ensure that this problem is dealt with effectively, several mitigation measures need to be addressed. Some, if feasible, can be accomplished fairly quickly; others have a longer lead time. For this reason, work on the access issues should start as soon as possible and continue at maximum intensity through at least the end of the program period. At this point, a "go/no go" decision on the MLC must be made, since the Fort Mason Foundation needs to pursue its own plans for Pier One.

In order of least complicated to most difficult, the mitigations are:

1. Survey of current parking utilization and potential revenue generation by gating, metering or permitting the Fort Mason lot.

2. Reorganizing the Fort Mason lot; restriping the pavement, etc.

3. Shuttle bus down the Marina Green: this is possibly linked to revenue generated from number 1 above.

4. FMC control of City-owned lot outside Fort Mason gates. Potential to gate, meter or restripe it to gain more spaces or revenue.

The next set of access mitigations are linked to the National Park Service plans for the Presidio and the likelihood that under any circumstances the NPS will request a parking/traffic plan at Fort Mason.

5. Opening the tunnel: This requires coordination between the NPS and City of San Francisco. A survey must be concluded of the tunnel condition, especially regarding seismic stability, as well as an estimate of improvement costs. Marina neighborhood input will be expected and potential environmental impacts will need study.

6. Ferry Service. The NPS has mentioned that ferry service to Fort Mason is a real possibility and that negotiations are underway. Costs and engineering issues need study. How long before it could be in operation, if it will require subsidy, how it might link into a Bay network of destinations are all outstanding questions. The number of visitors it might bring to the MLC and to Fort Mason will need to be estimated.

These mitigations will need time to implement. However, they could greatly affect the access capacity of Fort Mason and might impact the phasing of MLC. It is

important, given the required lead time, that these issues be addressed immediately.

4. Management & Organization

In the short term, the project requires a local point of contact to drive it. Implementation of the vision needs a great deal of energy, initiative and knowledge of the local community or the current momentum will dissipate. A project leader needs to be designated as soon as possible. One of the first actions of that project leader should be to convene a small working group as a resource. This group can help in resolving many of the key issues and be a vehicle for creative ideas.

In the long term, this working group should explore what organizational form is best in order to program, design, raise funds and operate the MLC. Models should be sought by looking at how other people have done it;

- Should it be run by NOAA directly, with a local advisory committee?
- An interagency effort by NOAA and NPS?
- Should a special non-profit cooperative association be formed?
- Has the private sector a role? Is there a possibility for a profit version? and would it make any sense?
- How does the form of organization relate -- if at all -- to what is going to happen in the Presidio?
- What differences in organization are likely if this is *a)* a unique, one-of-a-kind NOAA venture, or *b)* a model for MLC's in a variety of NOAA domains?
- How does the organizational format affect getting funding?

5. Funding Development

Again there are two targets. In the short term, the organizers need to generate the money for program and design. In the longer term, by the end or middle of design, funding for construction will need to be secured.

A strategy to do both will need to be developed in the interim period. The funding strategy will need to account for the complications of NPS funding needs for the Presidio, cuts in the Federal budget, lack of available state funding, etc.

6. Schedule and Phasing

The schedule is very ambitious and the project needs to move aggressively forward immediately. An obligation exists to inform the Fort Mason Foundation as soon as possible in the process if the project will continue. If it does not, the Fort Mason Foundation wants to line up other tenants. Pier One will be vacant soon, and is an opportunity for both NOAA and the FMF that had not been available until the Presidio transition.

The attached schedule shows that phasing is largely contingent on *a)* the access to funding and *b)* the timing of funding availability. If the Marine Learning Center is

to be successful, the first phase has to go with a bang, get a lot of publicity, etc. Therefore, the first phase should *not* be minor or timid.

7. Milestones

There are four or five very important milestones:

1) Acquisition of planning funds - around 1 June 1994.
2) Demonstration of more definitive feasibility -- programmatic and financial -- that will allow local players (especially GGNRA Commission, FMF Board, neighbors) to sign off and formally endorse the project. This is probably also the "go/no go" for FMF - around 1 November 1994.
3) Acquisition of funding for construction -- around 1 August 1995, if contracts are to be awarded 1 January 1996.
4) Award of contracts for construction -- November 1995.

8. Fort Mason Center

If MLC is to get the formal endorsement of Board of Directors in Fall of 1994, it is important to start detailed work with the Fort Mason Foundation now to address their critical issues.

The following issues need resolution:

- Parking, traffic, and access mitigations.
- Income to Fort Mason: The FMF has planned for capital improvements revenue through either *a)* their control/development of Pier One or *b)* revenue from MLC to FMF as landlord.
- Management strategy to minimize conflict of special event scheduling, etc.
- Supplementing facilities within Fort Mason: MLC restaurant and theater components should be designed to complement existing Fort Mason facilities.

9. Programming

The first major task of the period designated as the "Program Period" is to collect all of the information developed in the "Marine Community Input" task, plus the other information and analysis generated with NOAA. Adding this information to data on similar relevant facilities, it will be possible to formulate the *specific* programmatic content of MLC.

The programming period will involve the expansion of the mission statement and the goals of MLC; the definition of the unique niche it will occupy among marine related organizations; the development of the "lens" or "focus" that derives from the Sanctuaries and Reserves Program structure -- what will be told, exhibited, seen,

touched, etc. -- that is, the "curatorial philosophy".

The end product of the program period is a document that extends the relationship between mission, goals, curatorial philosophy into specific groupings of activities, exhibits and programs.

The program is the basic document that provides the foundation for:

- The design of the exhibits
- The layout and design of the Pier One space
- The integration of the exhibit design and space/building planning
- The development of "an initial business plan" encompassing the organizational design, staffing requirements, operating costs, etc.

This programming phase is a vital, critical part of the planning process. It converts the broad vision for the MLC into specific activities. It forces concentration on the issues that must be identified, analyzed and resolved before the design of the building can progress.

A great deal of work has to be done in a short time. The final product is a document that describes: mission, curatorial philosophy, programs, space location, size, technical requirements, etc.

10. Exhibit Design

An exhibit designer should be included in the programming team to provide early input on concepts accessible technology, fabrication, costs. The actual design of the exhibits is a process that runs more or less parallel to the building design. The final output is the working drawings for exhibits that allows bids to be obtained for fabrication and installation.

11. Building Design

Since the exterior (and to a more limited extent, the interior) cannot be extensively altered, the focus of the buildings design is what goes in the inside. It is vital that the architectural design reinforce the mission of the Center. Using the document produced from the programming phase, design of Pier One space can move forward in three phases:

- Schematic Design: The program is synthesized into basic space planning and concept alternatives for different components. An outline specification is delineated indicating major systems and materials choices. A preliminary estimate of construction cost is produced.

- Design Development: Space planning is finalized. All important aspects of the project are defined and described. The cost estimate and specifications are refined.

- Working Drawings and Construction Documents: Formal documentation of the steps, details, plans, materials and systems to architecturally realize the Marine Learning Center. The final documents of this phase allow bids to be obtained to build the facility.

Building design is also accompanied by a series of approvals and discussions with governing agencies. The National Park Service has historical and building code oversight and will need to be consulted as every phase. It is likely that the City of San Francisco Fire Department will also need to review the final building plans. The Fort Mason Foundation will have an interest in the architectural design of the Pier.

Conclusion

A target date for starting construction of January 1995 is not unobtainable. However, in order to meet this target, a sustained and intense effort will be necessary. The scoping study just completed has sparked interest and gained support for a particular vision of a Marine Learning Center that is exciting and inspiring. The momentum generated to date must be harnessed to move forward rapidly.

Gulf of the Farallones National Marine Sanctuary

Management Plan Executive Summary

Gulf of the Farallones National Marine Sanctuary Management Plan

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Marine and Estuarine Management Division

Gulf of the Farallones

GULF OF THE FARALLONES NATIONAL MARINE SANCTUARY MANAGEMENT PLAN

November 1987

Prepared for:
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Marine and Estuarine Management Division

Prepared by:
James Dobbin Associates Incorporated
Coastal and Ocean Planners
Alexandria, Virginia
Under Contract No. 81-ABC-00209

THE EXECUTIVE SUMMARY

This management plan was prepared for the Gulf of the Farallones National Marine Sanctuary — one of two such sanctuaries in California. (The other site is the Channel Islands National Marine Sanctuary in southern California.) National marine sanctuaries are ocean areas protected and managed for their significant natural and cultural resources and human uses. Management generally consists of environmental education activities, research that focuses on marine issues, and better coordination among regulatory agencies. Management also increases protection of marine populations and habitats through monitoring and contingency planning.

The Gulf of the Farallones National Marine Sanctuary encompasses 948 square nautical miles of nearshore and offshore waters of the eastern Pacific. The area was designated in 1981 in accordance with Title III of the Marine Protection, Research, and Sanctuaries Act. This management plan is a means of ensuring that the activities planned for the sanctuary over the next ten years comply with the overall intent of the program and the objectives stated in the *Final Environmental Impact Statement* (National Oceanic and Atmospheric Administration 1980) for the site's designation.

Objectives

The plan updates the goals and objectives for the sanctuary as presented in the *Final Environmental Impact Statement* (National Oceanic and Atmospheric Administration 1980). The improved protection of the marine environment and resources of the sanctuary is the general goal given highest priority. Compatible multiple use of the ocean area, increased public awareness and support, and a management-oriented research program are other important and complementary goals. In the plan, detailed objectives are provided for each goal which represent clear targets against which the success of the program can be evaluated.

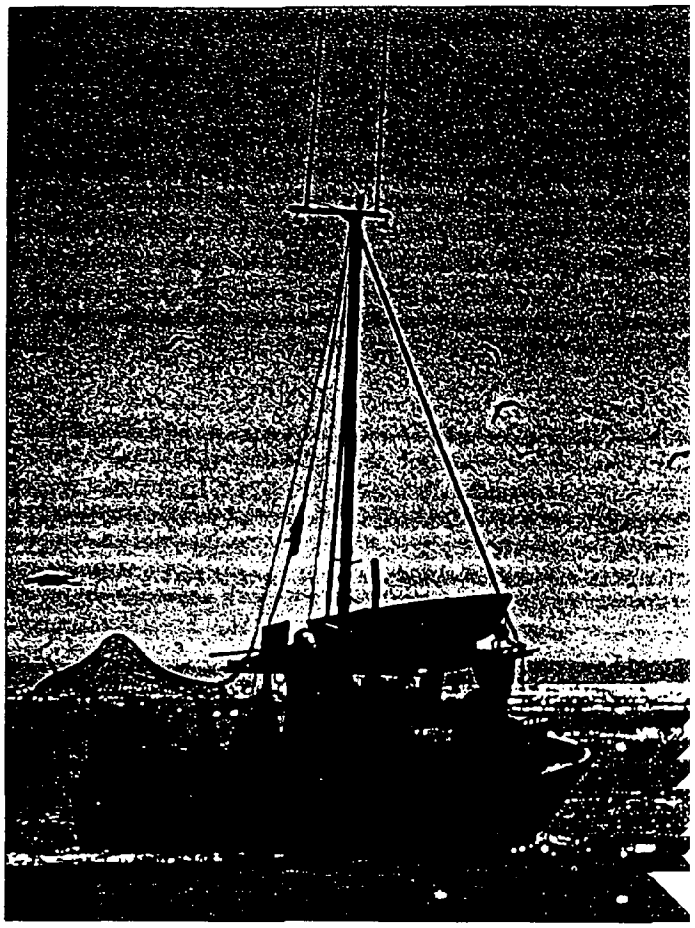
Sanctuary Environment and Resources

Located in the waters just north of San Francisco, the Gulf of the Farallones National Marine Sanctuary provides many examples of the marine life and habitats characteristic of the cold temperate waters of the eastern Pacific marine region that extends from Point Conception to British Columbia.

Most of the sanctuary lies in the Gulf of the Farallones between the western edges of the continental shelf and the coasts of Marin and Sonoma counties. Some of the largest and most diverse eastern Pacific populations of seabirds and pinnipeds (seals and sea lions) south of Alaska occur in the Gulf. Large flocks of Cassin's auklets, common murres, western gulls, and the endangered brown pelican feed on the small fish and crustaceans that are abundant in the surface waters of the sanctuary. These food resources also support California's largest breeding population of harbor seals and a rapidly growing population of northern elephant seals. Large numbers of whales and dolphins, including the California gray whale and the Pacific humpback whale population, are found in the area. There are many other significant nearshore habitats represented within the sanctuary such as the extensive wetlands of Tomales Bay and Bolinas Lagoon and the large intertidal and subtidal reef at Duxbury Reef. A complete spectrum of marine habitats ranging from the intertidal to the pelagic and deep oceanic environments can therefore be found within this sanctuary.

Marine Uses

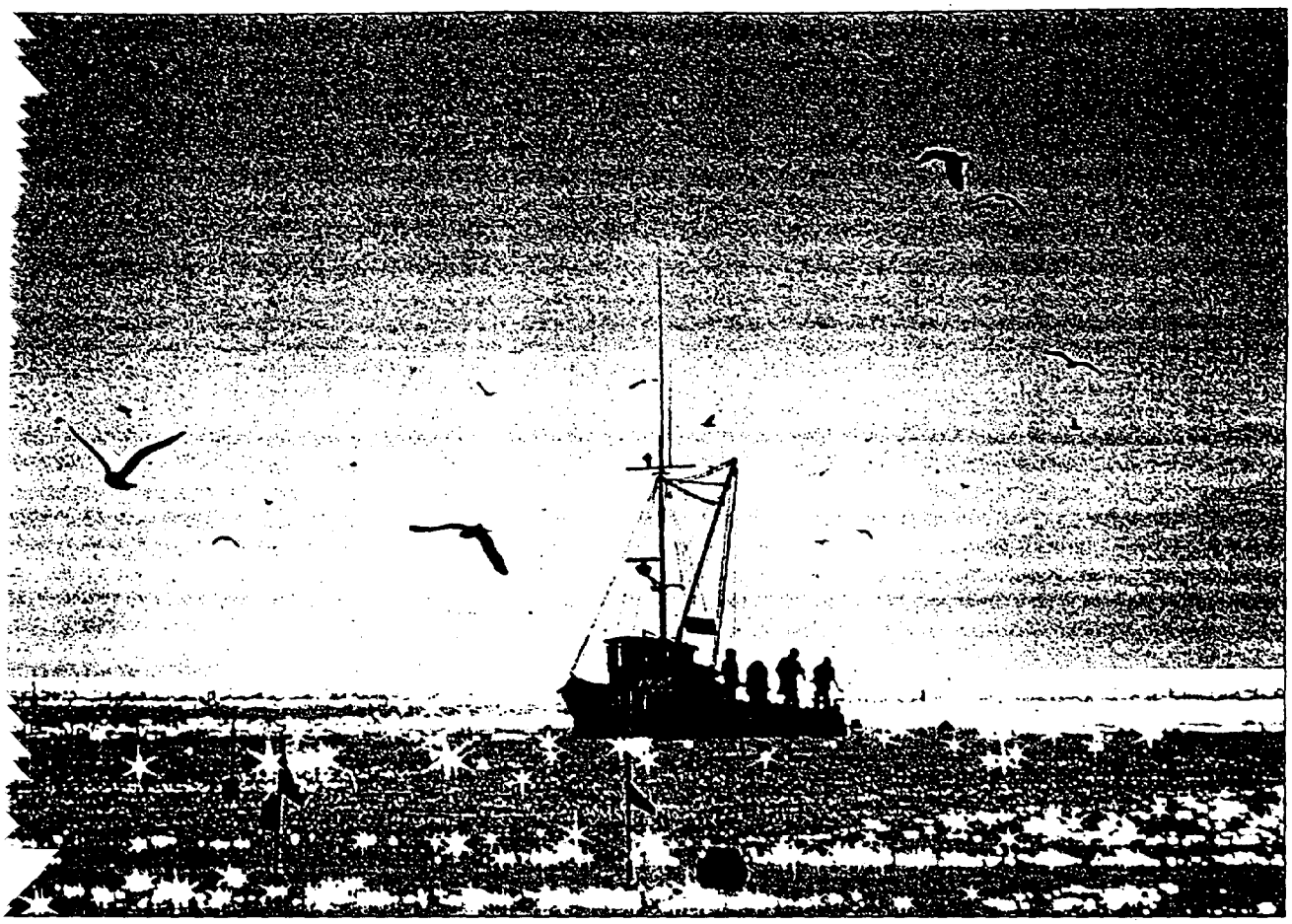
The sanctuary also illustrates how the ocean and its resources are important for the economic and social well-being of a region. The area supports many large commercial fisheries including a large percentage of San Francisco's bottom-trawling and salmon-trolling fleet. Sport fishing for salmon, rockfish, and other species is a very popular activity that generates revenue for the partyboat fleets operating out of San Francisco Bay, Half Moon Bay, and Bodega Bay. Whalewatching and offshore excursions are other uses of the sanctuary that are steadily growing in popularity. And of course, the sanctuary contains some of the west coast's busiest shipping lanes.



Management Concerns

While the sanctuary continues to provide relatively undisturbed and natural habitats for marine life, recent observations and ongoing research indicate some changes that are of particular concern for sanctuary management. There is, for example, a need to better understand the long-term effects of potential accidental oil spills and chronic pollution of resources, since these are still poorly understood. Increasing numbers of seabirds and small cetaceans such as the harbor porpoise become entangled in gill nets, but the effects of this incidental take on populations are not known.

The plan identifies many other concerns or issues for sanctuary management such as the lack of public awareness of the site's existence and the need for greater coordination among the agencies that have jurisdiction within the area. These issues and others are the basis for an action plan that is organized into three program areas: resource protection, research, and interpretation and education.



Resource Protection

The resource protection program addresses in a comprehensive manner the problems that have been affecting habitats or populations within the sanctuary in recent years. Specific measures include:

- a public information program aimed at disseminating marine resource regulations and policies including existing laws and guidelines mutually enforced by collaborating agencies;
- more effective and directed "on-the-water" surveillance and enforcement of regulations;
- procedures for a coordinated review and evaluation of policy revisions and/or proposed new activities and developments that could affect sanctuary resources;
- improved contingency planning and additional measures for emergency response to deal with accidental discharge of pollutants;
- development of a management-oriented information base that can be used for monitoring or as a readily accessible baseline for making policies.

Research

Scientific research is encouraged at the sanctuary, particularly where research results can help resolve key management questions. The plan outlines general priorities for research for the next decade. These include:

- baseline studies for populations and habitats whose presence were critical in the sanctuary's designation, yet whose distributions and other basic characteristics remain poorly understood;
- directed monitoring studies focusing on indicator species and representative habitats and undertaken jointly with other agencies;
- analytical studies aimed at determining the cause of a condition or impact (in a specific population for example).

The program includes additional procedures aimed at ensuring that research projects address management issues and that results are effectively integrated into the education and resource protection programs.

Interpretation and Education

Environmental education and interpretative efforts at locations overlooking the sanctuary, within the sanctuary, and in the broader San Francisco Bay area are an important component of the plan. The aim is to develop a program that can lead to active and widespread public support.

The main activities included in the plan are as follows:

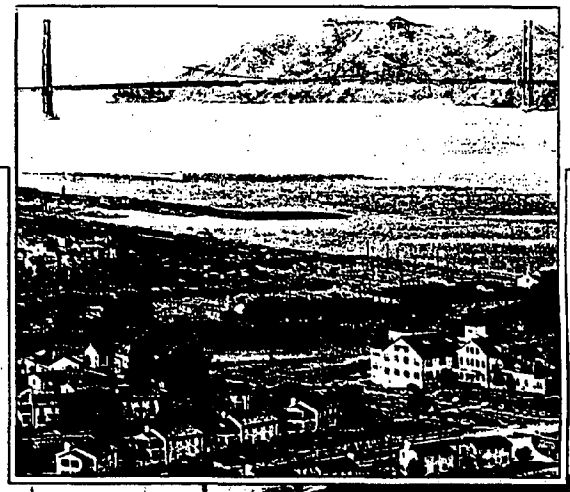
- design and production of high-quality printed materials such as brochures and posters that can be used for general program orientation and in public outreach;
- special sanctuary offshore excursions and coastal walks;
- lecture series and special field seminars;
- design and production of outdoor wayside panels to be located at points overlooking the sanctuary;
- design and production of exhibits and audio-visual presentations to be used in regional educational facilities;
- coverage in the local media and Bay Area promotional publications;
- investigating the need for an additional visitor facility.

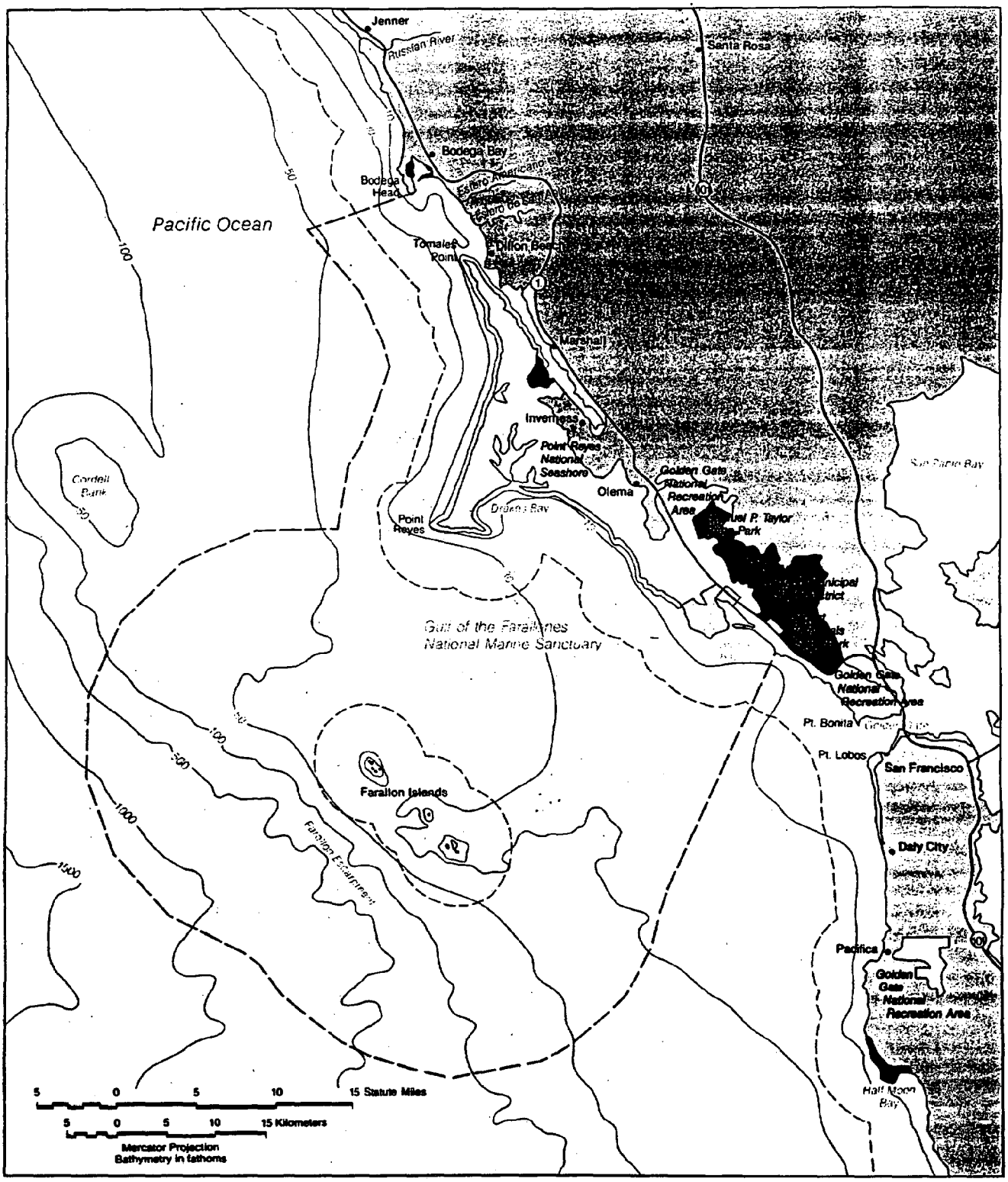
The Marine and Estuarine Management Division will undertake many of these activities in collaboration with the extensive local network of private non-profit and public organizations that offer educational services in the San Francisco Bay area.

Administration

The administration of the sanctuary is the responsibility of the Marine and Estuarine Management Division of the National Oceanic and Atmospheric Administration and its on-site staff. The Division coordinates activities, designs and implements programs, and determines priorities for education and research. The California Department of Fish and Game is the agency authorized to conduct on-site surveillance and enforcement within the sanctuary under an agreement with the Division. The National Park Service provides assistance to the Division in day-to-day administration, and developing and implementing the education program, on-site interpretation, and the research program.

The emergence of new issues may affect specific aspects of sanctuary management as described in this plan. However, the overall goals, management objectives, and guidelines will continue to be relevant and all actions will continue to be a step towards realizing the long-term resource protection goal. During the next few years, the aim is to carefully adjust the plan to changing circumstances and possibly expand it with new programs in light of the experience gained in actual management and with the support of other agencies and the public.





Gulf of the Farallones National Marine Sanctuary Boundary

3-Mile Limit

Federally Managed Parks

State and Locally Managed Parks

Figure 1

Regional Context

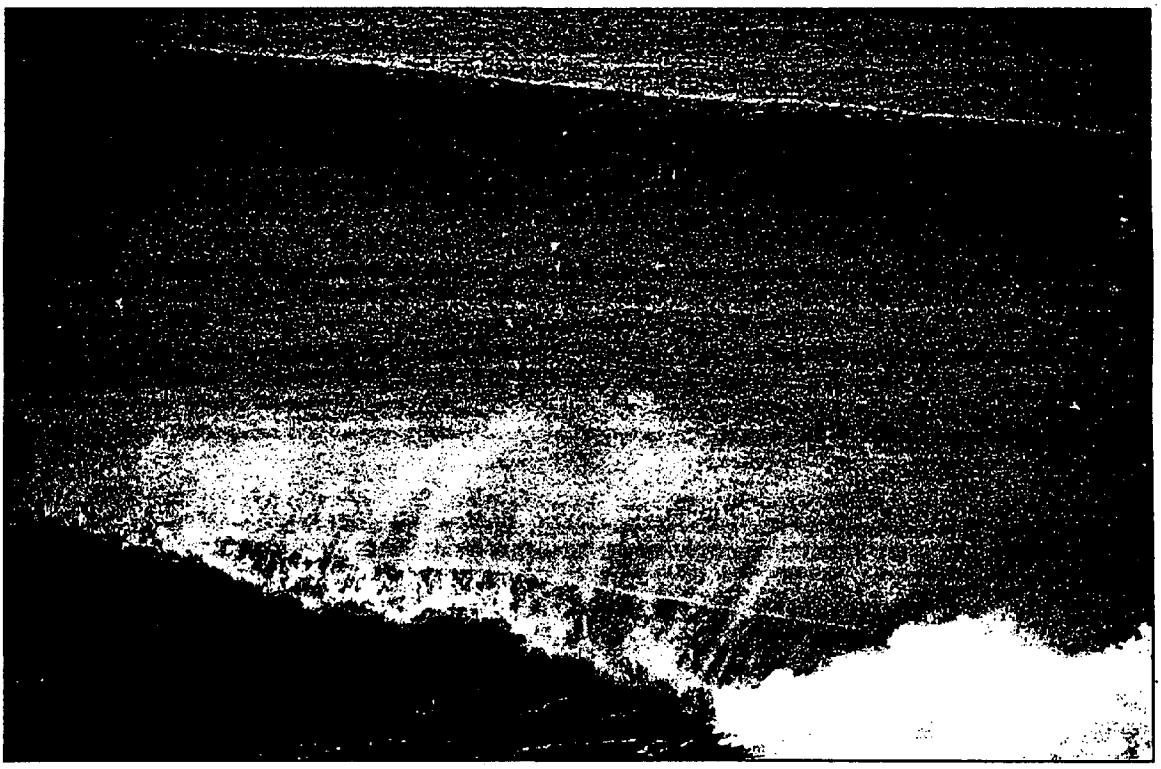
About this plan . . .

This management plan is designed to inform sanctuary users and the general public about the Gulf of the Farallones National Marine Sanctuary and the various activities that are planned for the site over time. The *Final Environmental Impact Statement* and final regulations established the sanctuary boundary and regulatory controls, with the sanctuary formally being designated in 1981. This plan serves to guide the agencies responsible for sanctuary management in implementing the goals and objectives stated in the *Final Environmental Impact Statement*.

The National Marine Sanctuary Program is responsible for the review and periodic update of this plan so that it reflects the information and experience gained through sanctuary operations. Readers are invited to contribute their comments and suggestions to this ongoing process. For further information about the sanctuary, readers may contact:

Sanctuary Manager
Gulf of the Farallones
National Marine Sanctuary
Fort Mason, Building 201
San Francisco, California 94123
(415) 556-3509

Marine and Estuarine Management Division
Office of Ocean and Coastal Resource Management
National Oceanic and Atmospheric Administration
1825 Connecticut Street, N.W.
Washington, D.C. 20235
(202) 673-5126



Center for Marine Conservation

Proposal for Marine Learning Complex

Center for Marine Conservation
Burr Heneman, Director, Pacific Region

Draft 2/7/93

A Gulf of the Farallones/Monterey Bay Marine Learning Complex

This proposal describes a new interactive, multi-media approach to making our natural and human marine environments much more accessible to the public. It would be operated by the National Marine Sanctuary Program and its cooperating association. Other participants in the project could include GGNRA, a Bay tour boat operator, various elements of the maritime industry, Point Reyes Bird Observatory, US Fish and Wildlife Service and the fishing industry.

The guts of the system would be housed in the marine learning center at Pier 1 in Fort Mason, however Pier 1 - with its visitor center, classrooms, and lecture hall - would be just one of the locations for applying this system in the Gulf of the Farallones region. To be most successful, the marine learning center will break out of the walls of Pier 1 and reach people elsewhere. Bay and Farallones tour boats, the Point's Reyes Lighthouse, Pier 39 in San Francisco, the Cliff House in San Francisco, the Army Corps' Bay Model in Sausalito, schools or any place where people congregate on or near the water. Eventually, Monterey Bay locations could be added to the system, or a similar system could be developed for that area.

The Experience - On the Water

We are on a bay tour boat during herring season. Our boat approaches and idles near a herring boat that is pulling its net. Our guide hails the herring boat skipper by radio (which is connected to our boat's speaker system) and ask him a few questions about what we are witnessing before we move on. We've had a glimpse of something new, and we'd like to know more. We find one of the large video screens on board that is tied into a video library. A listing and buttons allow us to punch up short, prepared informational videos on the herring roe fishery: how the fish are caught, how they are processed, what their ultimate destination is.

Our guide points out a flight of Brandt's Cormorants arriving in the Bay to feed. It's seabird breeding season on the Farallon Islands, and our guide puts live video sound from a Farallones cormorant nesting area on the video. She can zoom in on a nest where an adult has returned to feed its chicks. Then she cuts to a camera in a Common Murre colony and tells us something about that species. (If it were Winter, we could get a live glimpse of an Elephant seal pupping area.) When she is through with the live video, we are able to select short, prepared videos from the library that show the dramatic fledgling of murres or tell us a little more about their life history strategies or local seabird conservation issues.

On our way across the Bay, we pass astern of a tanker inbound to Long Wharf in Richmond from Valdez. Our guide punches up the Coast Guard VTS video on our screen and the marine vessel communications channel on our boat's speaker system. Perhaps she contacts the VTS operator, or a deck officer on the tanker and asks a few questions about the vessel and its voyage. Later, we can punch up videos that show us the Prudhoe Bay oil field and informs us about the Trans Alaska Pipeline, tanker safety, and Chevron's Richmond refinery.

The Experience - At Pier 1

A prominent feature in the Sanctuary visitor center at Pier 1 are several large video screens with several options. We can see live video from various locations, including two or three cameras on the Farallones, hand-held cameras and microphones on one or more tour boats, the VTS system at Yerba Buena Island, the container terminal at the Port of Oakland, a harbor seal or sea lion haul out

somewhere in the area.

Besides the live options, we can choose from a vast library of prepared videos to learn about the oceanography or marine life of the area, the maritime industry, various local fisheries or anything else to do with the marine environment.

If we are part of a school group, we may meet in a Pier 1 classroom where our guide has the video resources at his disposal to illustrate his task or to help answer our questions. The same system can be used in a small lecture hall at Pier 1.

There are other, more traditional elements of the marine learning center at Pier 1 - live marine tanks, permanent and changing exhibits on conservation issues, programs offered by partner organizations - but the interactive video system is the centerpiece of the Sanctuary's effort.

The Experience - Other Permanent Locations

The same system, or perhaps smaller-scale versions, are installed at other locations where people congregate near the water; visitor center at the Point Reyes Lighthouse, the Cliff House, Alcatraz, and a new Sanctuary-operated visitor center at Fort Cronkite in the Marin Headlands, as well as Pier 39, the National Maritime Museum, the Hyde Street Pier and perhaps Ano Nuevo State Park. Santa Cruz and Monterey might be locations for units until a similar system is developed with a focus on the Monterey Bay National Marine Sanctuary.

The Experience - Temporary Locations

"Portable" versions of the system, including the live video tie-ins, can be taken to schools to help teachers provide a special unit on the area's natural and human marine environments. From time to time, one is set up for a few days on ferries operating from Larkspur, Sausalito and the East Bay.

National Museum of Natural History

Ocean Planet Exhibit

TRANSCRIBED FROM PUBLICITY RELEASE OF THE NATIONAL MUSEUM OF NATURAL HISTORY, DECEMBER 7, 1993

Ocean Planet

A new exhibit form the National Museum of Natural History, opening in Washington, D.C. in April 1995 and traveling to other museums nationally in 1996.

A World Worth Our Attention

After centuries of seafaring, we are only now beginning to plumb the workings of our watery planet. The deeper we go, the clearer it becomes that no matter who we are or where we live, we all have a hand -- and a stake -- in what happens in the seas.

The difficulties of diving into complete darkness, frigid water, and extremely high pressures hobbled exploration in the past. But new sophisticated submersibles and precise remote sensing have revolutionized oceanography. Researchers are discovering exciting fundamental facts about the oceans and the teeming life of the seas support.

With this knowledge has come recognition that even landlubbers take much from the sea. Often unwittingly, we are imperiling the oceans. More than three-quarters of coastal ocean pollution originated on land. Unhealthy oceans hold hidden dangers for everyone.

This exhibits reminds us that in ways we may never have even considered, we are all seafarers, and its offers us ways to become more seaworthy - to think about what everyone ca do to conserve the Ocean Planet.

A Totally Immersing Experience

Over 99 percent of living space on Earth is ocean, all habitable by plants and animals. Marine life is astounding in its diversity. Marine life is astounding in its diversity. In 1986, biologists identified the thirty-third major group, or phylum, of animals - loriciferans, microscopic creatures that live been sand grains. The seascape is equally intriguing; the longest sea-floor mountain range is more than four times as long as the Andes, the Rockies and the Himalayas combined.

The exhibition opens by immersing visitors in the remote reaches of the ocean planet.

Ocean Planet:

- A large-screen animated "fly-by" takes visitors from a point in space over North America to soar over the Pacific, then to dive near Hawaii and "fly" underwater past Japan, through the Marina Trench, to resurface near New Guinea.

- An intricate, visually arresting sculpture represents the oceans' biodiversity with an unusual or beautiful example of each phylum of plants and animals, and several distinctive phyla of marine fungi, blue-green algae and bacteria.

- Photo panels with newspaper-style headlines and copy spotlight recent advances and late-breaking news (e.g., the US Navy's surveillance sonar recently allowed scientists to track blue whales and "witness" a deep-sea volcanic eruption).

- A walk-in model of the Johnson Sea Link captures the excitement of diving in a

submersible to see Bahamas deep-sea dwellers at close range - an experience that few people will ever have in real life.

- A lab setting with real oceanographic and navigational equipment and computer models focuses on contemporary research and satellite monitoring, and points out how ocean currents profoundly affect us.

Seafarer's Stories

Listening to the seafarers reveals common theme: maritime communities feel a strong sense of unity; they integrate their traditions with current technology and information; and their work is extremely risky, both financially and physically. Decisions about ocean conservation will need to address their social and economic concerns.

We are all sea people, in the sense that our lives or livelihoods take us to the beach or sea. The exhibition introduces visitors to other sea people:

- a sea-album video presents tourists on a beach, oil-rig workers, scientists, tugboat operators, fishermen, etc., with related quotes, music, poetry, and conversation (open captioned).

- objects and photos in a shore setting describe customs of sharing the catch, and the roles of men and women among many cultures (Inupiat Whalers, San Diego tuna fishers Maine lobstermen, Micronesian clans who control fishing areas, African women fish dealers, etc.).

- fishing boats, traps, hooks, and nets from around the world show the integration of traditional experience and modern methods.

- charms, amulets and protective totems used in many fishing societies (from medal of Catholic Saints to wooden carvings of Koranic text) testify to the dangers fishermen face.

- a pop-art collage of maritime Americana at this section's exit emphasizes our cultural ties to the sea, in products, photographs, "dictionary" entries about the maritime roots of words.

Surprises in Stores

Unless you eat seafood everyday, you might not necessarily think that you depend on sea "services" daily. Ocean plants, animals, minerals, and seawater itself provide a staggering list of essential products.

To help recognize them, the exhibition invites visitors to browse in the sea store:

- "product information labels," some with bar codes that can be read by hand-held bar-code readers, identify many likely and not so likely sea products.

- sea shoppers can chooses from many departments:

  Seafood
  Pharmacy (drugs, surgical aids, traditional remedies, medical research)
  Clothing & Accessories
  Personal Care (over-the-counter medicines, cosmetics)
  Hobbies (aquarium fish)
  Power Tools (energy sources from the sea)

Recreation & Tourism
Shipping
Books, Music, Art, Religion
Recycling Center (water, carbon, phosphorus and nitrogen cycles)

- for "blue-light specials", docents or educators may bring carts with additional materials to amplify concepts.

- a check-out counter tallies the global bill for sea items used locally everyday by everyone. At a cash register with keys coded for ocean products, visitors, "check out" the value of shipping on the global market or the number of people who rely on seafood diets.

What Do We Have To Lose?

Beyond their obvious beauty, marine habitats such as coral reefs, mangrove forests, kelp forests, estuaries, the polar ecosystems, and the deep sea furnish far-reaching support for human endeavors.

The Exhibit Sounds a Wake-up call about world-wide threats:

- a warning beacon beams headlines, quotes and other graphics about marine emergencies (red tides, marine mammal die-offs, coral bleaching, etc.).

- a vivid assemblage of objects entangled in a big net, possibly with sound, depicts dangerous symptoms (oiled birds, netted turtles and dolphins, beach trash, etc.)

- panoramic color photomurals of threatened marine habitats remind visitors of what is at stake.

Signals Ahead

While oil spills and beach trash regularly make the evening news, other warning signs aren't easy to name. It's clear that over fishing and dumping raw sewage cause problems; it's not as immediately apparent that automobile exhaust and pesticide-laden water from fields far away are equally troublesome.

To help visitors navigate the shoal, life-sized models of buoys mark the course through oceans in peril:

- for each hazard. a buoy explains the threat, illustrates its effects and outlines current responses, using graphics, objects and hands-on activities.

- buoy 2 examines coastal-water problems: agricultural run-off, air pollution, sewage and "carpetbaggers" (non-local species released in ships' ballast water).

- buoy 3 investigates tampering with watersheds and coastal areas: mining and dumping, tourism, inland deforestation, and dammed rivers.

- buoy 4 reports on overfishing, habitat-destroying fishing (with cyanide and dynamite), and by-catch (non-target animals such as turtles trapped in shrimp nets).

- buoy 5 summarize s global warning, sea-level rises, ozone depletion, and coastal development and population growth.

Putting the Pieces Together

It's not enough merely to deplore the dangers to the oceans: we must deal with them. But in real life there may be no easy answers. Simple fixes may have wide economic and social consequences.

To see several sides of a questions.

Computer-game stations let visitors try their hands at ocean management:

- a computer simulation with interviews of real people illustrates issues facing conservation in the Pacific Northwest: hydroelectric dams, hatcheries, Native fishing rights, habitat changes, etc.

Messages in the Bottle

The dangers to the ocean planet are dire, but it's not too late! Taking small measures in our daily routines can vastly improve the oceans' outlook.

The exhibition closes with opportunities for reflections:

- "Dewars profiles" features heroes of ocean conservation, from kids' groups cleaning up beaches, to scientists, to international-treaty negotiators, and give each exhibition venue the opportunity to honor local heroes.

- a sound-and-light artwork designed to encourage reflection on the exhibition's messages complements panels answering "What can <u>you</u> do?"

- at the exit, visitors can answer "What <u>will</u> you do?" by leaving a message in a bottle. Messages will be collected in notebooks for other people to read--a call to action for the Ocean planet.

Economics Research Associates

Economic Analysis

Attendance Potential and Economic Performance of the Propose Marine Learning Center at Fort Mason, San Francisco

Prepared for
BACKEN ARRIGONI & ROSS, INC.

By
Economics Research Associates

January, 1993

Project no. 11003

MEMORANDUM

TO: Backen Arrigoni & Ross, Inc.

FROM: Jim McCarthy

DATE: 20 January 1994 **PROJECT #** 11003

RE: Marine Learning Center at Fort Mason -- Market and Economic Analysis

INTRODUCTION

In an attempt to both educate and entertain the public about the ecosystems found in San Francisco Bay and the nearby offshore marine sanctuaries, a Marine Learning Center (MLC) is being proposed at Pier 1 on San Francisco Bay. The MLC should serve as an important protagonist for the proximate marine sanctuaries much in the same manner as the visitor centers at the large National Wildlife Refuges do, the terrestrial counterpart of the marine sanctuaries program under NOAA.

Preliminary conceptual plans for the center are being prepared by Backen Arrigoni & Ross (BAR). In support of these planning efforts Economics Research Associates (ERA) was retained to provide market and economic support projections. Accordingly, comparable marine science centers, National Wildlife Refuges, natural history science centers, as well as local museums in the San Francisco area were surveyed with size, visitation, costs, and revenue generation being the focus. The results of these surveys are discussed in the following synopses.

MARINE SCIENCE CENTERS AND RELATED FACILITIES

Oregon Coast Aquarium (OCA)/Hatfield Marine Science Center (HMSC)

Oregon's first fully developed aquarium is now 100 percent operational and thriving in Newport, Oregon. Set on 32 acres, this facility on the Oregon Coast attracts large numbers

of visitors (841,000) for a facility so remote from major metropolitan areas. As indicated in Table 1, the OCA includes four acres of outdoor exhibitry complemented by 12,000 square feet of indoor aquarium and exhibits. Dramatic exhibits include seabirds, marine mammals and fishes enable the Oregon Coast Aquarium to command an adult admission price of $7.35. Visitors spend an average of two hours at the facility which attests to its strong attention holding ability.

The Oregon Coast Aquarium collaborates closely with Oregon State University's Hatfield Marine Science Center (HMSC) also located in Newport. Whereas the OCA interprets the local coastal and offshore marine ecosystems, Hatfield's focus is global in nature utilizing their worldwide oceanographic data acquisition capabilities, including remote sensing data from NOAA satellites. Planning for expansion of the Hatfield Center which currently draw about 300,000 persons per year is under way, benefitting from a $492,000 NASA design grant. The mission of the HMSC is to increase public appreciation and awareness of marine and coastal organisms and environment, promote wise stewardship, and communicate results of research -- basically educating the public on how and why we study the ocean. Both institutions host many organized school groups to stimulate students in cultivating a strong interest in the marine environment.

Expansion of the Public Wing of the HMSC, or the interpretive center, is now in the planning stage. All existing permanent displays will be dismantled and updated. Temporary displays will be modified toward a more interactive approach. The addition of 8,000 to 9,000 square feet of permanent exhibition area will undoubtedly go far in implementing the mission of the Public Wing of the HMSC. This space almost doubles the current size of the public display area. This increase of exhibitry should have a positive effect on increasing visitation to the HMSC. Future attendance may, however, be influenced by the imposition of an admission fee.

The HMSC is viewed by ERA as probably the most comparable institution to the proposed MLC at Pier 1. The experience at HMSC, especially during the proposed expansion of the visitor/education center (Public Wing), should be of great value to planning/design

TABLE 1

COMPARABLE ATTRACTIONS

Facilities/Attraction	Oregon Coast Aquarium/Hatfield Marine Science Center	Virginia Maine Science Center	Sea Center on Steams Wharf
Theme	Marine Education; Entertain	Marine environmental education	Increase public knowledge and appreciation of the Santa Barbara Channel
Attendance	841,000 OCA; approx 300,000	334,000	76,000
Origin of Visitors	All 50 states	19.7 Canada 58% out of state	10% California residents 20% Santa Barbara area 60% - 70% Southern California
Seasonality	50% summer peak	50% summer peak	Summer peak
Admission	$7.35 Adults - $5.25 Seniors $3.00 Ages 13 - 18	$4.75 Adults $4.00 Children, Seniors	$2.00 Adults - $1.50 Seniors $1.00 Ages 3 - 18
Size	32 acres 4 acres outdoor exhibits 12,000 square feet indoor exhibit	24,000 square feet exhibits 11 acre site 41,500 square foot building	2,500 square feet 90% exhibit area
Live Attractions	Birds; marine mammals; fish; jellyfish; kelp	Salt and fresh water aquarium; touch tanks	Aquariums; Life size gray whale model
Length of Stay	2 Hours	1.5 - 2 Hours	20 Minutes
Annual Operating Budget	$3,800,000	$8.5 million	$160,000
Staffing	64 full-time employees	30 full-time employees	2 full-time employees
Cost of Development	$24 million	$8.5 million, in 1986 $35 million remodel 1993	$609,500
Source of Support	Admissions; retailing; grants; bonds	IMS Grant "City" Virginia Beach; admission; gift shop	Admission sales; class fees; grants
Setting	Rural	Rural	Santa Barbara Channel

efforts at Fort Mason. These centers will be of tantamount importance to the increasing "eco-sensitive" public awareness on the West Coast.

Virginia Marine Science Museum

The Virginia Marine Science Museum (VMSM) is located on Owl's Creek, a short distance inland from the resort area of Virginia Beach, Virginia. This is a diverse estuary with more than 200 species of flora and fauna contained therein. The 41,500 square foot building contains 23,000 square feet of permanent exhibits and 1,200 square feet of temporary exhibits. The two main sections of the permanent exhibits are "the journey of water" and "man and the marine environment." Chesapeake Bay is represented with a 40,000 gallon aquarium featuring a diversity of Bay habitat. A "coastal river room" contains a 6,600 gallon aquarium with a variety of fresh water fish and the only albino snapping turtle ever recorded on the East Coast of the United States.

Attendance at the VMSM has averaged about 340,000 over the five-year period from 1986 to 1991, although declining slowly during that period (see Table 2). Given the relatively small local population base, this attendance is considered to be a strong performance. Very few visitors to the VMSM travel more than 150 miles to see it unless they stay overnight (see Table 3). This experience would lead one to believe that only a small minority of visitors will travel to see the MLC at Pier 1 from outside the greater nine-county Bay Area unless it was in conjunction with other alternative destinations and activities.

Sea Center at Stearns Wharf -- Santa Barbara, California

The Sea Center is a small museum (2,500 square feet) located on Stearns Wharf in the Santa Barbara Channel adjacent to the City of Santa Barbara. The Sea Center could easily serve as a model for larger marine education centers. An integrated program of cooperation has evolved between the various agencies involved. Area schools, the Channel Islands National Marine Sanctuary (CINMS), the National Oceanographic and Atmospheric Administration (NOAA), and the Santa Barbara Museum of National History (SBMNH) have made the Sea Center the hub for marine investigations, field trips and research into the ocean's

TABLE - 2

ANNUAL ATTENDANCE AT THE VIRGINIA MARINE SCIENCE MUSEUM

Fiscal Year	Attendance (000)	Percent Change
1987	358	-
1988	339	-5%
1989	334	-1%
1990	343	3%
1991	323	-6%
Average	339	

Source: Virginia Museum of Marine Science

TABLE - 3

DAY VERSUS OVERNIGHT VISITORS TO THE VIRGINIA MARINE SCIENCE MUSEUM

Distance (Miles)	Day	Overnight
0 - 25	98%	2%
25 - 50	89%	11%
50 - 75	85%	15%
75 - 100	15%	85%
100 - 125	11%	89%
125 - 150	8%	92%
150 - 175	3%	97%
175 - 200	5%	95%

Source: VMSM Surveys; and
Economics Research Associates

influence on the history of the region. The Sea Center exhibits include the very popular "touch tank," a life sized gray whale replica, realistic undersea dioramas, aquariums and computer/video displays. Educational programs include field trips and a variety of lectures and special programs given by staff members. This small Marine Science Center draws about 75,000 visitors annually.

NATURAL HISTORY MUSEUMS

For statistical information on the following museums see Table 4.

Virginia Living Museum, Newport News, Virginia

This natural science museum set within a medium sized metropolitan area provides an excellent learning experience for 110,000 students who it visit annually. Otters and bald eagles in various stages of rehabilitation are but a couple of the many species represented at this seven-acre museum. Five different stream ecosystems are depicted in aquariums recreating habitats found in the nearby James River. Approximately 40 percent of the other 115,000 visitors are "stop-off" visits from Interstate Highway 64, one and a half miles from the site.

Discovery Place, Charlotte, North Carolina

This impressive urban museum complex offers a diversity of exhibitry including an IMAX theater, huge rainforest exhibit and plentiful aquariums. A projected 1992 attendance of 368,000 visitors and an annual operating budget of five million dollars shows what is possible when several museums cooperate under 150,000 square feet of space.

High Desert Museum, Bend, Oregon

Set in Eastern Oregon, the High Desert Museum features great natural scenery with looming Mount Bachelor, Deschutes River and nearby lakes. Unique outdoor exhibitry, such as the otter aquarium, lets visitors get up close and personal with nature, unlike typical zoo encounters. This approach to exhibiting nature apparently appeals to everyone as evidenced

TABLE - 4

GENERAL CHARACTERISTICS OF SELECTED NATURAL HISTORY MUSEUMS AND ENVIRONMENTALLY RELATED ATTRACTIONS

Category/Attraction	Virginia Living Museum Newport News, Virginia	Discovery Place Charlotte, North Carolina	High Desert Museum Bend, Oregon	Museum of the Rockies Bozeman, Montana
Theme	Stimulate knowledge and understanding of the environment	Stimulate knowledge and understanding of the environment	Education, entertaining the public, promoting throughtful management	History
Annual Attendance	1190 - 222,059	1991 - 214,027, SC - 88,140, SE - 20,470 - 29,0000, remodeled projected - 368,000, school - 117,000, SP Events 53,000	195,000	189,000 in 1991 46,000 in 1983
Origin of Visitors	50% regional, 50% tourists	Tourist season, 70% out of state, 50% - 50% rest of season	53% Oregon	33% Bozeman 33% rest of Montana 33% out of Montana
Seasonality	July-August-September	SPWG - Summer	Summer peak and recreation traffic	Spring-summer-fall-winter
Admission Price	Adults-$500, Students (child)-$3.50	3 Selections; students - $7 maximum - $8.00	Adults - $5.00	Adults - $4.00 MSU Students (13-18) - $2.50 5-12 years -$1.50
Size (acreage, sq.ft.)	7 acres, 29,500 ft. building inlcudes netted avalary	150,000 sq. ft. building - exhibit - 1 city B	150 acres, 20 acres trails, 10,000 square feet changing exhibit	95,000 square feet
Live Attractions	Others, Bald Eagles, trace James River Aquaria, 5 different stream types, touch tank	Rainforest, Snake, Aquaria, fish	River otters, birds of prey,porcupine exhibits "national attention"	Dinosaur exhibit, "Terrible Lizards"
Length of Stay	1.5 hours	3 Hours	2 Hours	2-3 hours
Annual Operating Budget	$1.6 million	$5,000,000	$1.8 million - $600,000 in house revenue $1.2 million in donations	$2,669,946
Staffing	29 full-time, 20 part-time 275 volunteers, 1 -4-hour shift	178 - 68 full-time - 110 part-time	45 Full-time employees	
Cost of Development	$4.5 million - building only	1980 - $11,000,000 1989 - + $1,000,000 1990 - $14,000,000	$12 million	1989 - $9.5 million addition
Sources of Support	70% Admissions, school contracts, 30% State cutoff city, 200 sq. ft. gift shop	70% internal, 30% outside	5,000 members $600,000 in-house admissions and concessions $1.2 donations, other	MSU & State, membership, donations
Setting		Urban	Rural	University setting

by a large annual attendance (195,000 visitors per year). Oregonians visiting the facility amount to 53 percent of annual attendances. Out-of-state visitors are primarily from California and Washington, and comprise 76 percent of the remaining attendees. Heavy recreational traffic during the summer on Highway 97 undoubtedly contributes to the success of the High Desert Museum. The High Desert Museum captures an estimated 4 percent of Highway 97's recreational traffic which is a very good performance, and points to the reason for success of this facility.

Museum of the Rockies

The Museum of the Rockies (MOR) is operated as a private non-profit 501(c)(3) corporation. It is a department of the Montana State University located at Bozeman, which provides partial support for its operation. The proposed focus of the museum is Natural History. This facility includes a planetarium show exploring the formation of the universe, the solar system and planet earth. The museum focuses sequentially on geological history with emphasis on the formation of the Rocky Mountains and its interesting paleontology with special emphasis on the dinosaurs that inhabited what is now North America's Rocky Mountains. The museum's story carries forward through the age of mammals, prehistoric man, the Plains Indians, the arrival of Europeans, and finally early settlements.

The museum recently completed a 63,600 square foot expansion program (at a cost of $9,500,000) that tripled the size of the facility.

The museum's attendance reached 189,000 in 1991, a dramatic increase over the 46,000 attendees visiting the museum in 1983. The 1989 expansion about doubled the facility's annual attendance. The new planetarium, which was part of the expansion program, is credited with a good share of that increase. The MOR's visitor origin is 22 percent from Bozeman, 38 percent from the rest of Montana, and 38 percent from out of state, a market segment that has had strong growth since the expansion. General admission is currently $5 for adults, $3 for teens and MSU students, $2 for children 5-12 and free for under 5. Planetarium shows are $2.50 and $4.50 for laser shows.

SAN FRANCISCO COMPARABLES

Periodic surveys reveal that museum-oriented attractions in San Francisco draw between 250,000 and 1.4 million visitors per year. Two facilities in particular are considered particularly relevant to this study, the nearby Exploratorium and the California Academy of Sciences. The educational facilities at Marine World Africa USA also shed light on the market's affinity for marine-related learning activities.

The Exploratorium

The Exploratorium is located within the Palace of Fine Arts near the Presidio of San Francisco. As indicated in Table 5, the facility occupies 104,000 square feet which is provided rent-free by the city. The museum is filled with over 600 exhibits, most of which are interactive. Exhibits pertain to scientific and technological subjects such as light and color, sound and music, patterns of motion and electricity, life sciences, mathematics and many other aspects of nature. Perception is the main theme for the museum, and the interactiveness of the exhibits serve as an effective teaching tool especially to the many school age children who frequent the museum. Included in the 104,000 square foot space are exhibit space, classrooms, museum store, fabricating shops, graphics department, office space, storage areas and a 200-seat theater. Attendance in 1991 was 660,000 which included over 50,000 school children on field trips and 35,000 in special groups such as disadvantaged and handicapped groups. Approximately 60 percent of attendance was adult and 40 percent was under 18 years old. Exploratorium management revealed that 10 percent of attendance originated from San Francisco while 35 percent came from the nine surrounding Bay Area counties and 55 percent came from beyond the Bay Area and worldwide.

California Academy of Sciences

The Academy of Sciences is a museum complex located in Golden Gate Park. The complex contains approximately 175,000 square feet of exhibit space (see Table 5). Included in the museum complex is the Steinhart Aquarium with its popular Fish Roundabout, the Morrison Planetarium, presenting several different sky shows each year as well as Laserium

TABLE 5

COMPARABLE ATTRACTIONS - SAN FRANCISCO

CATEGORY/FACILITY	EXPLORATORIUM	CALIFORNIA ACADEMY OF SCIENCE (STEINHART)
Theme	Individual Learning Through Direct Personal Experience	Conviction: "Understanding Prompt Respect."
Annual Attendance	1991 - 660,000	~1.5 Million 1/3 nonpaid (Outreach)
Origin of Visitors	1992: 52% Bay Area; 21% CA 18 Out of State; 9% Foreign	40% Bay Area 60% Other
Seasonality	July, August Peak	Summer Peak
Admission	Adults $8.00 - Seniors $6.00 Ages 6-17 $4.00 College Students $6.00	Adults $7.00 - Seniors $4.00 Ages 6-11 $1.50 - Ages 12-17 $4.00 Under 5 $0.00
Size	104,000 square feet	175,000 square feet
Exhibitry	All Interactive - Made on site	Planetarium Large Number Quality Aquariums
Length of Stay	2.5 Hours	2.5 Hours
Annual Operating Budget	1993 - $11,200,000 1992 - $8,953,000	1990 - $12,000,000
Staffing	231 FTE; 175 Volunteers	200 Full-Time Employees
Cost of Development	Not Available	N/A Built in 19th Century
Sources of Support	50% Donations;50% Earned Revenue	Admissions, Grants, Foundations
Setting	Urban; San Francisco Bay	Golden Gate Park

and the Wattis Hall of Man. In addition, there are halls devoted to animals, plants, gems, fossils, and space debris. Attendance at the museum is quite high due to the scale of the museum and the diversity of exhibits. Currently about 1.5 million visitors attend the museum annually. Museum officials indicated that approximately 60 percent of the visitors are non-resident. Admission is $8 for adults, $4 for students 6 through 17 and seniors, and college students are $6.

Marine World Foundation, Vallejo, California

In addition to its more obvious entertainment orientation, Marine World Africa USA which is operated by , the Marine World Foundation, encourages research and education. Extensive educational facilities are available. The Chevron aquarium features microscopes, environmental habitat replicas, audiovisual resources and more for use by the general public and school groups. Over 200,000 school children and adults participate in one of the foundations educational programs annually. These programs are described in Table 6. Research programs related to the bottlenose dolphin communication and killer whale vocalization are ongoing in cooperation with various universities. The Marine World Foundation is also continuing its involvement with marine mammal rescue and rehabilitation, as well as species survival programs.

NATIONAL WILDLIFE REFUGES

A recent ERA survey of National Wildlife Refuges reveal that 24 of the more popular refuges throughout the country attracted an average of 267,750 persons per year (see Table 7). Considering the remote locations of many of them, this achievement is viewed as a strong testimony of the public interest in the wildlife and wildlife environments of the country. Accordingly, it is our feeling that a fish and wildlife-oriented center in San Francisco, with its large potential markets should likewise generate a strong public following.

Table 6

THE MARINE WORLD FOUNDATION
1993/1194 Calendar of Youth and Senior Events

Education Program	Period Offered	Cost	Actual as of 10/93	1994
Self-Guided Visit	Wednesday-Friday September - June	$7.50 - $ 8.50/person	105,030	110,000
Closer Look	Monday - Tuesday October - April	$250/Group AM $200/Group PM Group = 35 or less (Maximum group size 40)	6,560	5,000
Discovery Tours	Wednesday - Friday October - April	$10.50/person	2,577	2,000
Classroom Study	Wednesday - Friday October - May	$110-$230/Group depending on number of programs and time of year	36 programs January-October 1,000	
School Assembly Safari	September - June	$325/1st Assembly $125/each additional assembly at same school on same day	300 programs January - October 79,000	
Marine World's On Wheels Preschool Program	Monday - Friday Year-round	$250/program (includes four separate 1/2 hour visits)	7,000	
Individual Education Programs, including Summer Safari	Ongoing	Varying Costs	1,995 3,141	3,000
Living Science	During school year	Free to Vallejo 5th graders, paid for by grants	881	
Teachers/Principal Days	November - January	Free to California Educators		
TOTAL			120,184	120,000

Table 7
COMPARISON OF VISITOR CENTER COUNTS WITH TOTAL VISITS TO SELECTED NATIONAL WILDLIFE REFUGE

	Interpretive/Visitor Contact Center	Number of Visitor
Aransas	53,623 IC	72,603
Laguna Atascosa	16,626 IC	78,183
Santa Ana	87,952 IC	260,132
Bitter Lake	12,170 VCS	43,814
Bosque Del Apache	20,299 IC	84,434
Seney	20,670 IC	62,127
Tamarac	9,063 IC	50,691
DeSoto	185,853 IC	446,027
Mingo	13,895 IC	121,118
"Ding" Darling	158,775 VCS	854,248
Loxahatchee	52,996 IC	370,518
Okeefenokee	36,092 IC	351,152
St. Marks	18,876 IC	194,001
Wheeler	32,916 IC	604,038
Blackwater	42,600 IC	150,415
Bombay Hook	15,213 VCS	79,042
Chincoteaque	125,240 VCS	1,491,008
Brigantine	49,383 VCS	195,117
Montezuma	47,471 VCS	164,681
National Bison Ranges	48,794 IC	122,372
Nation Elk Reserve	175,105 VCS	532,274
Fort Niobrara	6,900 VCS	34,717
Kodiak	9,624 IC	20,192
Tetlin	10,675 IC	28,801
TOTAL	1,083,400	6,411,705
Average Number of Visitors	267,750	

Source: 1987 Refuge Management Information systems - Public Use Reports; compiled by ERA

CONCLUDING OBSERVATION

The visitation recorded at the various environmentally related attractions discussed above indicate a strong and growing interest in what's happening to Planet Earth. This suggests that an excellent Marine Science Center developed at Fort Mason should have a receptive audience from which to attract visitors.

MARKET ANALYSIS

Length of stay has a profound influence on the distance the general public will travel strictly for the purpose of visiting museums, visitors centers, and other types of attractions. Obviously, as length of stay increases so does the distance people will travel to visit it. By and large, it is rare that more than five to ten percent of a facility's visitors will be generated from locations outside the regional catchment area whose boundaries is defined in terms of travel time equal to the average time spent in an attraction. In the case of the MLC, we estimate that the scope of visitor attractions will be sufficient to retain visitors on the average of about one and a half hours. Based on this expectation, a resident market catchment basin coinciding with the nine-county region surrounding San Francisco Bay, plus maybe Sacramento County, would appear to be a realistic definition of the market area from which the MLC could generate attendees. Obviously, this does not apply to people who will travel to the San Francisco Bay Area for other purposes and then visit the MLC.

The market available to attend the MLC includes approximately six million residents within the greater Bay Area (nine counties, Table 8). For the purpose of conservative estimating, Sacramento was not included.Also included are 8.5 million (Table 9) tourists from other regions. These two groups comprise an available market of some 14.5 million persons. Both residents and/or tourists to San Francisco have economic characteristics well above the national average.

ESTIMATED ATTENDANCE

ERA's projection of attendance at the MLC is predicated on the following assumptions:

TABLE - 8

RESIDENT MARKET
1990 POPULATIONS OF NINE BAY AREA COUNTIES

County	Population
Santa Clara	1,497,577
San Francisco	723,959
San Mateo	649,623
Alameda	1,279,182
Napa	110,765
Marin	230,096
Contra Costa	803,732
Solano	340,421
Sonoma	388,222
TOTAL	6,023,577

Source: California Department of Finance

TABLE - 9

SAN FRANCISCO'S TOURIST MARKET

Source	
Visitors staying in San Francisco Hotels	3,025,000
Visitors staying elsewhere in San Francisco	1,310,000
Visitors staying elsewhere in the Bay Area	4,200,000
Total Visitors from Outside the Bay Area	8,535,000

Source: Economics Research Associates

1. The average length of stay will be one and a half hours.
2. The cost to develop the MLC will be about $20,000,000. This equates to approximately $400 per square foot reflecting a facility and exhibit program of superior quality.
3. The entire building will be utilized according to-Scheme "B" and the area utilized for exhibitry will approximate 19,000 square feet.
4. The MLC will be entertaining as well as educational and feature a "high impact" film and many interactive exhibits with broad age appeal.
5. The MLC will be aggressively marketed including cross promotions with the Exploratorium, California Academy of Sciences and other science-oriented attractions in the San Francisco Bay region.
6. Public transportation will be available to transport approximately half of the visitors to the MLC.
7. Adequate onsite parking will be available during peak attendance periods.
8. The MLC will have various educational programs for school groups.
9. Admission fee will reflect those shown in this report.

Given the above assumptions, the following projection of attendance is deemed attainable -- a capture rate of five percent of the six million residents yielding 300,000 visitors and a capture rate of 3.5 percent of the 8.5 million tourists, for an additional 297,000 attendees. This produces a yearly attendance of 597,500 and compares favorably with 660,000 visitors annually attracted to the nearby Exploratorium.

ESTIMATED REVENUES

Admissions

Assuming 50 percent of the annual visitation is tourists and 50 percent is residents of the Bay Area (Experience at Exploratorium), we arrive at the revenue projections derived from admissions as indicated in Table 10, which shows the estimated visitor mix and recommended admission prices. As indicated annual admission revenues are estimated to total $2.1 million.

TABLE - 10

ADMISSION REVENUES

MARKET	% OF TOTAL	ESTIMATED VISITORS	RECOMMENDED ADMISSION PRICES PRICES	ADMISSION REVENUES
Residents				
Adults	17.5	104,563	$ 4.50	$470,533
Children	7.5	44,812	$ 3.00	134,436
Student Groups	25.0	149,375	$ 1.50	224,062
Tourists				
Adults	45	268,875	$ 4.50	$1,209,938
Children	5	29,875	$ 3.00	89,625
TOTAL	100	597,500		$2,128,594

Source: Economics Research Associates

Restaurant

The restaurant proposed under Scheme "B" is approximately 5,300 square feet. We are assuming annual sales of $400 per square foot producing annual gross receipts of $2,120,000. We are further assuming a concession payment of six percent of gross revenues which yields $127,200 to the MLC. (One hundred thousand dollars annual base rent would seem reasonable in lieu of six percent annual sales.)

Gift Shop Revenue

As indicated in Table 11, ERA estimates that a professionally organized and operated gift store at the MLC could generate $1.15 million in sales and net about $230 thousand annually.

The cost of goods is estimated to be 45 percent of total sales. The operating cost are estimated to be 35 percent of total sales.

The gift shop included in "Program Options" Scheme "B" is assigned 1,080 square feet. ERA feels this is too small and a more realistic size would be closer to 3,000 square fee t.

Additional Revenues

Rental of the facility for special occasions such as weddings and office parties after hours can contribute to the annual income of the MLC. Assuming a fee of five hundred dollars for the rental of the facility and 100 bookings per year (an additional $50,000/year) should be attainable given a strong marketing strategy. There is potential for other money to accrue to the MLC through memberships and special programs. These, however, are not estimated in this analysis.

TABLE - 11
GIFT SHOP VISITOR EXPENDITURES AND NET INCOME

MARKETS	ESTIMATED VISITORS	ESTIMATED EXPENDITURE BY INDIVIDUAL MARKETS	ESTIMATED REVENUES
Residents			
Adults	104,563	$ 2.00	$ 209,126
Children	44,812	$ 0.75	33,609
Students	149,375	$ 0.50	74,687
Tourists			
Adults	268,875	$ 3.00	$ 806,625
Children	29,875	$ 1.00	29,875
TOTAL	597,500		$1,153,922
Cost of Goods Sold		45%	$ 519,265
Operating Expenses		35%	403,873
Net Income from Gift Store		20%	$ 230,784

Source: Economics Research Associates

TOTAL REVENUES

The total annual revenues potentially generated by the MLC is as follows:

Source	$ million
Admissions	2.13
Gift Shop	0.23
Restaurant	0.13
Facility Rental	0.05
TOTAL	$2.54

ANNUAL OPERATING EXPENSE (Exclusive of Occupancy Cost)

Annual operating expenses are estimated using cost per square foot of building minus the restaurant. We have assumed a facility with about 43.4 thousand square feet and have used a cost per square foot factor of $46.38.

Total square footage	48,710
- Restaurant	- 5,290
	43,420 square feet

43,420 sq. ft. x $46.38* = $2,013,819.6 estimated annual operating expense

*See Table 12.

Source: Association of Science Technology Centers

PARKING CALCULATION

Given: Annual Attendance = 597,500

Peak month = 14% of annual of annual attendance = 83,650

Peak Week = 83,650 ÷ 4.428 = 18,891

Peak Day = 0.17 x Peak Week = 3,211

In Facility @ 0.25 x 3,211 = 803

If: 50% in facility arrived by car, or 402 people, and each car carries 2.6 people then available parking should be [155] spaces.

STUDY CONCLUSIONS

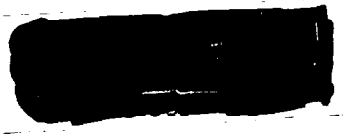
The following conclusions can be made about the feasibility of the marine learning center at Pier 1:

- Centers focusing on marine and terrestrial environments and their plants and animals are attracting increasing public interests.
- The MLC should increase the awareness and appreciation for the nearby marine sanctuaries through its proposed entertainment as well as educational programs.
- Annual attendance is estimated at nearly 600,000 visitors.
- The MLC as depicted in "Scheme B" should comfortably be able to accommodate peak "in-facility" crowds approximating 800 persons.
- Project generated revenues are expected to approximate 2.54 million annually; operating expenses about $2 million annually producing a potential operating surplus of about $500,000.
- Given the size of Fort Mason, it appears reasonable to expect that this facility should be able to accommodate the parking demands generated by the MLC - 155 autos.
- The location of the MLC on one of the world's most dynamic estuaries is inherently sensible.

Table 12

AVERAGE OPERATING EXPENSES PER SQUARE FOOT OF EXHIBIT BUILDING BY SIZE OF FACILITY

	Total Feet	Operating Expenses	Operating Expenses/ Square Ft
Very Small Centers	9,500	$617,000	$64.95
Small Centers	[illegible]	[illegible]	[illegible]
Medium Centers	120,000	$4,812,000	$40.10
Large Centers	370,000	$11,473,000	$31.01

Source: Association of Science-Technology Centers, 1987 Survey

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