CHESAPEAKE MARINE MARITIME MUSEUM
EASTERN SHORE, MARYLAND
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Obviously, I do not view this region with detachment. I consider myself an "almost" native who knows the tastes of fried soft crabs, the scent of wisteria growing against mellow brick, and the whistle of black duck wings in a starlit winter sky.

Thus my feelings for my native land sometimes cloud my vision. I had best begin with the cold facts and figures found on maps.

The Chesapeake Bay itself is a shallow, mostly brackish inland sea. The Atlantic created it long ago by drowning the lower reaches of the Susquehanna River. It is the largest estuary on the United States Atlantic coast.

Sailing the 195 miles from Bay mouth to the Susquehanna River, a helmsman need never vary his course by more than two compass points from due North. Should he head east or west, however, he would come upon cruising grounds to last his lifetime, for 48 principal rivers with 102 meandering branches flow into the bay, as well as countless creeks and marshy grasslands. Someone once wrote that a chart of the Bay looks like the deck plan of an octopus. To me, the little waters--"gunkholes" as the yachtsmen call them--are the best of the Chesapeake, and that includes their wonderfully evocative names. The charts show a Crab Neck and Crab Alley Creek, as well as other creeks names Cuckold, Canoe Neck, Tar Cove, Bullboggler, Ape Hole, Plaindealing, and Antipoison.

Capt. P.V.H. Weems of Annapolis, inventor of navigation systems used on all the seas, once was quoted to have said that "the Chesapeake tides ebb and flow upon 5616 miles of shoreline. Asked how he measured so exactly a shore constantly
changed by wind, wave and the tunneling of muskrats. "Maybe I'm a few miles off" he admitted, "I overlooked the muskrats."

Maryland and Virginia shore the Chesapeake which derives its name from an Indian word meaning "Great Shellfish Bay". Cutting the two states in twain, the Bay creates a very special land, the Eastern Shore, between the Chesapeake and the Atlantic Ocean.

Of old English stock, Shore people have their own speechways, customs, and fierce pride. Shoremen are the quintessence of Baymen, and the late Sam Whalen of Love Point on Kent Island was the quintessence of Shoremen. He was also one of the best of thousands of good Chesapeake fishing guides.

Bayside residents have rarely lacked for food. Chesapeake Indians, like their counterparts in North Carolina, feasted the year round on fish, crabs, and oysters. Sometimes the Chesapeake is bounteous beyond belief. H. L. Mencken once called the Bay an "immense protein factory". Surely the blue crab, packed with luscious white meat, is the leading citizen of the Chesapeake. He is the first creature the visitor sees, swimming sideways or backwards but never forward, brandishing formidable clews, eating almost anything that comes his way.

Because they can be cooked into many tasty dishes, crabs are big business, the main summer quarry of most Baymen who follow the water for a livelihood. In one good recent year the crab catch brought in $5,500,000, yet it was only comparatively recently that the Bay states began studying crabs and other seafoods. A generation ago nothing seemed to diminish the Bay's bounty too seriously, and we needed to know only how to take it.
"Times have changed," said William J. Hargis, Jr., director of the Virginia Institute of Marine Science. "We've been expecting H.L. Mencken's 'protein factory' to serve also as a seaway for commerce, a playground, and a sewer." How much household detergent can be dumped on white perch without killing them? Will the James River remain the Bay's best seed oyster ground if the channel to Richmond is deepened? How many marshes can be drained without crippling fisheries?

The Bay Museum sphere reaches far beyond its countryside location. The people of the area are proud of their maritime history, and concerned about protection of the natural environment. One of the purposes of the museum is to tell the story of the Chesapeake, (including its natural and human history) and another is to increase public awareness of the Bay's environmental problems. Only if the fragility of the regional ecosystem is better understood will conservation and resource management keep pace with, or overtake, the damage caused by current patterns of development, overfishing and pollution!
ACKNOWLEDGEMENTS

I wish to thank,

My parents, William and Karen Trueblood, for their love and monetary support; for without them these past five years would not have been possible. They never stopped believing in me,

My fellow colleagues and especially my wife Jane, for without her, I would have never made it, and

My professors, who helped me throughout my five years of architectural education.
THESIS PROGRAM

The Thesis Program at Ball State University is a three quarter program with emphasis on conceptual design, schematic design, design development and final design. It is our opportunity to pull everything we have learned in the last four years together into one project.

We have the control of choice of project, the program and the design. We work along with a studio, outside and landscape critic for feedback and assistance. The first quarter is spent on program, concept and schematic design. The second quarter is design development. The last quarter is dealing with presentation of material and documentation of the project in this book.
Architectural Thesis
ARCH 404, 405, 406
Academic Year 1983-84
Professors Mendelsohn, Meyer, Woodfin, Wyman

(Since thesis courses are taught concurrently, the basic objectives remain the same through each quarter for the respective level of development.)

Process Objectives

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**Alternatives:** to include 406 objectives, if 406 alternative is approved.

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**Alternatives:** Competition/Special Studies.
ABSTRACT

Several events and phenomena have influenced the growth of small boat sailing in America since the Nineteenth Century. They are:

The invention, production and widespread use of the motorboat and motorship as replacements for the older sailing designs used both for commerce and for pleasure;

The rise of the middle class in America and the increased costs of yachting in the traditional sense, where 40 foot yachts were considered "small";

The yachting periodicals, which, until recently, were publishing new small boat designs and the instructions for building the boats. Mass production of these craft came only after the Second World War;

The two World Wars, which left many yachtsmen without their large boats and/or the unrestricted waters on which to sail them and forced them to sail in small boats in protected waters;

The technologies developed during W.W. II gave the U.S. a yachting industry and new materials suitable to industrial processes--specifically fiberglass, for building hulls having compound curves;

The marriage of the boat and the automobile via the boat trailer, which has made competitions on a national level possible; and

The increased emphasis in all competition of the purely man-to-man contest, where the boats are so much alike that the differences are absolutely negligible.

The designing, construction and sailing of boats had been the province of the individual; and the best sailors were always men intimately acquainted with all aspects of the arts involved--they were craftsmen in every respect. With the advent of the wholly mass produced, standardized small sailing boat, one wonders how long there will be such craftsmen and ingenious thinking in the sport.
THE SITE

Access to the site will be primarily vehicular, by cars and buses via nearby highways. Secondary access will be by boat, with limited docking space available nearby. Parking will be required on the site, with room for expansion.

The site is assumed to be flat gravel fill, only 3 feet above high water. Tidal movement is approximately 1.5 feet between high and low mean levels of the tide.

The designer should assume use of the existing basin and its bulkheads. Additional dredging to accommodate the draft of stationary display boats (historic vessels such as skipjacks) and buildheading to adjust the shape of the water area is possible including options such as hard edges and natural edges in selected locations.
The basin's area should not be substantially enlarged due mostly to high cost.

There are no buildings on adjacent properties, and due to conservation land held as a buffer, no adjacent construction for other uses is anticipated. Trees on the site are currently minimal, but more can be added. The museum will stand by itself in its flat marsh landscape and as a result will be very visible from a distance, unless screened with new landscaping.

The existing lighthouse tower (see photograph and plot plan) is to be restored as an 1890 historic maritime artifact. It will serve the museum as a landmark element and its use will be limited to overlook viewing, meetings, and the like, requiring no change or adaption.

An existing 60 foot boat (see photograph)
A MARINE MUSEUM

The museum is to be located on a waterfront site, at the edge of a protected area of estuary and marsh on the Eastern shore of the Chesapeake Bay in Maryland. The area served by the museum consists of scattered small towns, some agricultural land and light industry. The fishing industry, including crabs and oysters, remain important to the area, although much diminished in scale and importance since the turn of the century. A regional population of 680,000 is found within a driving distance of 50 miles.

The people of the area are proud of their maritime history, and concerned about protection of the natural environment. One of the purposes of the museum is to tell the story of the Chesapeake, (including its natural and human history) and another is to increase public awareness of the Bay's environmental problems. Only if the fragility of the regional ecosystem is better understood will conservation and resource management keep pace with, or overtake, the damage caused by current patterns of development, overfishing and pollution.

Annual visitor attendance at the museum is projected at 150,000, half of which is assumed to be summer visitors from outside the region. During the fall, winter and spring the audience served is primarily local, including large numbers of school children who will be brought to the museum by bus, and spend approximately two hours at the site. Longer stays will be programmed in good weather, including outdoor activities. Classroom dis-
Discussion will play an important role for school groups in all weather conditions.
PROGRAM OBJECTIVES

The goal of the program is to develop a museum which will become a strong permanent attraction, offering an entertaining recreation experience as well as a coherent and powerful learning experience.

The mood of the museum is to be both playful and serious at the same time.

The museum must offer visitors a structured experience as a base, with additional resources made available for optional detailed exploration.

For example, visitors interested in salt-marsh ecology will be able to take optional field trips by boat from the museum, walks on an elevated path through a section of marsh directly adjacent to the museum, or explore the subject within the museum in-depth using video-disc consoles, books, artifacts, and other hands-on resources.

Construction costs are to be relatively modest, (neither minimal or extravagant). The architectural solution must allow for straight-forward use of conventional or available building technology, be energy efficient, and easy to maintain.
DESIGN POSSIBILITIES

The designer's task is to take maximum advantage of the waterfront site, to organize effectively and experientially the required components of the program, and accomplish through imaginative design a complex that reinforces the program, reaching beyond its minimal requirements to become an appealing magnet when seen from outside the site (from roads and water), and a memorable experience within.

Program components may be combined in numerous ways, ranging from a single weather enclosed building to a group of smaller separated buildings, since mild climate conditions allow some outdoor movement between buildings to be a planning option.

The initial design should be conceived as achieving a critical mass, having enough intensity to work well at the outset; and also allowing future expansion of both exhibition space and ancillary areas such as classrooms and administrative offices.
EXHIBITION CONTENTS

The museum's exhibitions will include the following components, and it is the architect's task to schematically provide adequate and appropriate shell space for their assumed detailed realization by exhibit designers and museum staff.

I. Estuarine Biology of adjacent waters and marshes.

Interior exhibits will include diagrams, models, large scale rear-illuminated transparencies, video-disc consoles for individual study use, aquarium tanks for underwater viewing and small habitat settings for above water viewing, both containing live animals. Daylight should be admitted to the habitat exhibits but be excluded from aquarium tanks and from audio-visual exhibits.

Exterior exhibits may include a raised walkway through the marsh within the site.

II. Maritime History

Interior exhibits will include artifacts of various sizes, ranging from fishing boats of up to 30 foot length to small hand tools. Sections of the exhibit area will be devoted to Indians, Colonial Settlement, Tobacco Growing, the War of 1812, the introduction of Steamships, Sailing Boats of the area, local Boat Building, and Fishermen, Crabbers and Oystermen--the "Watermen" of the Chesapeake.

Exterior exhibits may optionally include boats and other artifacts under an open shed (roof shelter only), as an architect-
tural element, and two to three boats of 40 foot length may also be displayed floating in the basin.

III. Auditorium

A small auditorium is to be included for continuous or intermittent presentation of a multi-image show. Its use will be for visitor orientation, requiring that its location be near the entrance. An optional exhibit on the visitor's tour, it may be by-passed during peak hours. The auditorium will also be used at night and at other times for special meetings and presentations.
PROGRAM AREAS

A. Indoor Space

1. Estuarine Biology 3,000
2. Maritime History 6,000
3. Lobby (including admissions/ information and adjacent museum retail shop) 2,000
4. Auditorium Orientation Theatre 1,500
5. Administrative Offices 3,000
   Professional staff (6), secretarial, accounting area, volunteer area, lunch room, kitchenette, storage, graphic and exhibit workshop, toilets and darkroom.
6. Library and Resource Center 1,000
7. Classrooms (2 @ 1,000) 2,000
8. Maintenance Area 3,000
   Paint shop, carpentry shop, vehicle storage and maintenance, receiving area for museum deliveries, storage and custodial offices.
9. Exhibit Support Areas 5,000
   Shops, labs and storage, adjacent or near to exhibit areas.
10. Restaurants (100 seats) 1,500
11. Mechanical Space (heating, cooling, water filtration, etc.)  2,000

Total Indoor Area  30,000 Sq. Ft.

B. Outdoor Space

1. Salt Marsh Walkway, if any  variable
2. Water Basin Edges, Terraces, Overlooks  variable
3. Parking (100 cars on site, buses off site)  variable
4. Drop-off Area for Cars and Buses  variable
5. Outdoor Food Service  variable
6. Dock Space for Visiting Boats  variable
7. Dock Space for Display Boats  up to 200 linear feet
8. Outdoor Exhibits (on land or water)  variable
9. Shed (Open Shelter) optional  up to 3,000 ft²
Building Type: Marine Exhibition

Example: Colombia River Maritime Museum

Architect: Grider, Gabriel & Potter

Special Organization:

The gorgeous site overlooks the mouth of the Columbia River. The design goals were achieved in a dramatic fashion chiefly due to the dominant rooftops that freeze and undulating symmetry suggestive of cresting waves in an ocean squall.

Large space volumes are required for the present variety of floor displays plus future acquisitions. The floor plan is intended for simple, economical construction plus an inviting public entrance leading to an exterior forecourt that is used as a permanent maritime display area.

The design requirement led to the use of glulam beams for roof structure, for economy and to fulfill the design theme; the inside, under-roof view resembles the hull structure of a wooden ship. The beams and all cedar shakes and shingles, for roof and siding, were pressure treated by J.H. Baxter with Koppers "NCX" formulation. Also, 339 anchoring pilings were creosoted for the pressure treatment, done by Dant & Russell. These pilings were driven down 20 feet due to the problem site, over a hardpan substrate that produced a load bearing of from 30 to 35 tonnes per pile.

The job was negotiated over a lengthy period of time: foundations (piling and concrete), July 1976 to October 1976; structural wood framing, June 1977 to October 1977; roofing and cedar wall shakes, July 1978 to October 1978; miscellaneous exterior underground M & E work, August 1979 and the heating ventilating, electrical and interior finish work from October 1980 through August 1981. Building construction took 24 months.

Source: Design Cost & Data, Sept.-Oct. 1983
Building Type: Marine Exhibition

Example: Tokai University Marine Science Museum, Suimizu, Japan

Architect: Yamada and Assoc.

Special Organization:
  Linear exhibition space reduced with zig-zag water tank, adjacent to 2-level exhibition containing large water tank and laboratories on the third level above. Service on opposite side behind water tanks. Space is highly directional along exhibits.

Circulation:
  Strong determinant of spatial design as the nature of space is high directional.

  Ramps around large tank and on exterior leading to third floor exhibition.

Materials:
  Unfinished reinforced concrete, no windows, cold, scaleless, inverted columns square at the top with recessed lighting, nicely defines circulation path.

Source: Japan Architect, Sept. 1970
Building Type: Oceanographic Institute

Example: Institute in Khimki, U.S.S.R.

Special Organization:
  Linear exhibition and laboratories
  (1 level) spanning large pond, transversed
  by circulation axis. Close relation of
  indoor and outdoor space.

Scale:
  Linear elements scale the building
  down to relation to total size.

Siting:
  Use of water--strong orientational
  experience.

Circulation:
  Strong horizontal dominance off of main
  axis into exhibition spaces.

Source: L'ARCH. D'AUJOURD'HUI
Building Type: Natural History Museum

Example: Natural History Museum and Planetarium Center for Environmental Design, LaFayette, LA

Architect: Neil Neurbass

Special Organization:
- Linear organization of exhibition spaces in two-level "skylight" building terminating at one end of directional space in a planetarium, small research offices and "senseatorium".

Structure and Materials:
- Steel frame and reinforced concrete block covered by horizontal bands of mirrored insulating glass unpretentious use of materials.

Siting Influences:
- Set in a natural environment with parking hidden on adjacent site. Mirrored glass blends well with environment.

Source: Forum, Sept. 1971
Building Type: Marine Laboratory

Example: Sea Lab, Robin Hoods Bay, York, England

Architects: Brierley & Leckenby

Special Organization:
Functions stacked on four levels of existing cottage. Basement--4000 gal. storage tank, air compressor, constant temperature room. Ground and first--aquarium, teaching labs, biochemistry and physiology labs with built-in fish tanks. Second--small study labs and tanks for seawater circulation.

Orientation:
Biochemistry and physiology labs have view towards bay.

Source: Architectural Review, April, 1968
Example: The International Ocean Exposition
Okinawa, Japan

Special Organization:
The theme of the International Ocean Exposition was "The Sea We Would Like
To See" and was the first international exposition to actually be based on the
sea. It reflects a common concern with environmental pollution and the upset of
balance between mankind and nature that has been brought about by excess industrialization. The exposition's goal:

"The desire to promote greater understanding of the seas and ocean
of the world, which were the womb from which all life developed, and
to contribute to the creation of better relations between man and his world."

The site of the exposition is a bow-shaped strip of land. The facilities are divided
into four clusters: Fish Cluster, Peoples and History Cluster, Science and
Technology Cluster, and Ships Cluster. The idea behind the cluster idea is to
create an impression of a town or village--a seaside park has been developed
between the Fish and Peoples Clusters.

Two buildings from this exposition will be discussed in this building types
study; the Aquapolis and the Aquarium in the Fish Center.
Example: Seattle Public Viewing and Research Aquarium, Seattle, Washington

Architect: Vetle Jrgensen

Special Organization:
The Seattle Public Viewing and Research Aquarium contains a complete research facility and a public facility as well. It has been broken up into two sites: one in Golden Gardens Park and one in Fort Lawton. Each facility has a sea tunnel which runs under the water of Puget Sound. The tunnel is made up of a walk tube containing exhibits and a panorama dome with seating for underwater viewing.
Example: New England Aquarium, Boston, Massachusetts

Architect: Cambridge Seven Assoc., Inc.
Peter Chermayeff—principal in charge

Special Organization:
The architects of the New England Aquarium saw this project as being "in some ways analogous to European churches, where the structure, space, lighting, works of art and numerous details all combine to create a special atmosphere or mood".

The entire single interior space of the Aquarium is surrounded by fish tanks on all levels so that visitors are given the feeling that they are being immersed in the mysterious world of the underwater environment. In the center of the facility is a giant freestanding cylinder, 40 feet in diameter and 4 stories high with windows all the way up and down its 23 foot height. Surrounding the base of this tank is a rectangular basin of water called "The Fresh Water Tray" in which resides former inhabitants of semi-tropical swamps.

The circulation pattern basically follows the Le Corbusier museum scheme of a rectangular spiral of narrow ramps on the perimeter of a rectangular plan for traffic moving upward. From the top level traffic descends via a spiral ramp surrounding the central giant atrium.
EXHIBITION CONTENTS

1. Estuarine Biology of Adjacent Water
   - Contents of water
   - Contents in tidal basin
   - Wildlife in adjacent areas
   - Migration patterns of birds, fish and crabs
   - Movement of rise and fall of water at different times during the day

2. Maritime History
   - Ship history—ship building
   - Maryland cultural history
   - Colonial settlements
   - Tobacco growing
   - Steamboats
   - Sailboats
   - Fisherman, crabbers, and oysterman
   - Floating boat exhibits

3. Auditorium
   - Multi-image show
   - Visitor orientation
   - General meetings
   - Special presentations
   - Maybe twin theaters

PROGRAM AREAS

Indoor
1. Estuarine Biology
2. Maritime History
3. Auditorium/Theater
4. Lobby
5. Administrative Offices
6. Library Resource Center
7. Educational Classrooms
8. Maintenance Areas
9. Exhibit Support Areas
10. Restaurant
11. Mechanical Spaces

Outdoor
1. Marsh Walkway
2. Terrace Overlooks
3. Parking
4. Drop Off
5. Dock Space—Visiting Boats
6. Dock Space—Display Boats
7. Outdoor Exhibits (Land or Water)
PERFORMANCE SPECIFICATIONS (Preliminary)

1. The concept is derived from the site constraints, site opportunities, and user needs.


3. Entry--major focal point "lighthouse".

4. Site and museum--an educational experience.

5. Public facility--accessible


7. "Museum image"--shell or tension type structure (take off of possible shell formations or tension structure being a take off of the old "tall ships" of the bay mast formation).
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