BROOKVILLE LAKE MARINA & RESORT
BROOKVILLE, INDIANA

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THESIS PROFESSOR: ROBERT KOESTER
1.0 INTRODUCTION
1.1 BACKGROUND & HISTORY:
Since the beginning of recorded history man has always been fascinated with the sport of sailing and boating. Such was the attraction that men were to explore the unknown discovering new lands and opening new trade routes. This was to lead to the establishment of great sea ports and harbors all over the coastlines of all the major continents. However, this desire for exploration is not limited to coastal cities. Inland waters attract the sailor and hold just as strong a grip on them without subjecting them to all the hazards of the open sea. Plus many of them are only able to be "weekend explorers" with needs just as real as the ocean explorers. Many are usually prepared, and often enjoy roughing it and going hungry. Getting wet, excited, and even frightened is very much a part of the fun. Although this seems to be part of boating it remains fun only with the knowledge that after their "ordeal" they may reach the safety of the shore. Once ashore the basic needs are simple:
1. Somewhere to get ones clothes dry, bath or shower.
2. Get something to eat or drink.
3. A place to chat about ones' experiences.

Brookville Reservoir located in Brookville, Indiana, which is about 36 miles N.W. of Cincinnati, Ohio is an already established water recreation area. Even though there is a mooring area and several boat launching areas the reservoir still lacks a central location or point of departure for the boating enthusiast and sportsman. The Indiana Dept. of Natural Resources working with the Kentucky Army Corp. of Engineers has recently shown an interest in the development of a marina/resort which would be able to accommodate a large crowd of people.
for the purpose of bringing more revenue into the area. They also wish to draw more people into the area to take up residence. As it stands now the reservoir is swarmed by weekend outdoor enthusiasts who only visit and leave after the weekend. It is their belief that with a marina/resort of some type they may encourage more permanent residents who'll begin to appreciate and help maintain the reservoir at a higher level of quality.

1.2 SCOPE: The scope and primary purpose of this program is to supply the client and designer for Brookville Marina and Resort with better insight, and information pertinent to the organization of this type of recreational facility. This program will try to give the client and designer a better understanding of user activity needs and the flexibility that will be required in this type of a facility. This information pertains specifically to environmental qualities, a square footage necessary to sustain the various spaces involved in the facility. Analysis of each space will help provide information needed to give the client and designer a better understanding of how equipment, furniture, and their performance can be a part of design.
Brookville Marina and Resort will cater to both hunters and fishermen as well as providing adequate facilities for all aquatic related activities.

The resort will act as homebase for indoor as well as outdoor activities. It will provide opportunities for clubs and social organizations to utilize the facilities.

Classrooms and demonstration areas will also be provided to instruct and enlighten individuals seeking a better understanding of nature and to further the enjoyment encountered on this truly magnificent site.

Although the marina/resort will depend upon these other functions it must also be able to act independently. Therefore activities in the marina/resort will concentrate on being an exciting element in the scheme itself. People may come to use the facilities for the sake of convenience but there will also be those drawn to the resort seeking activities associated with internal functions.

The marina/resort consist of four levels contained in two wings which are set at a 45° angle to each other. This was done in order to conform to the site topography and to create a feeling that the marina/resort is actually embracing and sheltering the mooring and beach areas. This configuration also allows the marina/resort to absorb as much solar energy as possible due to the prevailing southern exposure.

The marina/resort is positioned between parking and the mooring and beach areas for several reasons:

First, it was my desire for the marina/resort to become a transition from land to water and to act as the linking element.

Secondly, this creates a "back of the house" condition where all major circulation and receiving can occur without obstructing views to the water and without creating conflicting traffic patterns.
All of the four levels are designed and located so as to act as magnets for the main purpose of encouraging vertical circulation through the major central core. All levels radiate from this central space which is designed to familiarize the visitor with all the available facilities and activities to be found in the marina/resort.

The first level, which is located eight feet above the water, is devoted to all the recreational, retail, service, and maintenance areas. The recreational and retail functions are located on the shoreline providing easy access to and from the water. The service and maintenance areas are kept to the back where they are out of the way and yet located where they work most efficiently.

The second level, which is at the same level as parking acts as the major entry point from the landward side, contains all the socially oriented activities, dining and banquet facilities, and weekend living quarters. This level contains a museum and display areas, lobby and receptionist, restaurant, lounge, banquet and committee rooms, and guest rooms.

The third level consists of the more private club functions such as a boat owners' lounge, meeting and classrooms, library, and weekend living quarters. These functions are located on this level to prevent them from being disturbed by the more active activities. Also it was desired to create a more private atmosphere to the marina to encourage more private members to join insuring financial security.

The fourth level consists mainly of a "theme lounge" for nightly adult entertainment. It is perched two stories above the marina offering spectacular views to the water creating a high level of sophistication. This was done to encourage overnight stays and to draw a higher level of clientele from more remote areas.
3.0 GOALS
3.1 The main goals are to:

*Provide a facility which is stimulating to all the senses.

*Design a facility that adapts well to the site.

*Create a strong physical tie between the land and the water.

*To focus upon the natural amenities and to incorporate them into the project.

*To emphasize the importance of wind, water, and the sun, and how man can use these elements for other than recreational purposes.

*To create a conceptually strong project which is not only functional but sculptural as well.

*Maintain high levels of safety.

*Provide a high degree of technology in the facility and equipment.

*Provide good circulation which enhances the entire scheme.

*Provide Brookville with a facility to encourage settlement and the establishment of better living conditions.
4.0 SPACE REQUIREMENTS
4.1 SWIMMING POOL & SPA AREA:
5,000 S.F.

**Description:** area for swimming, diving, and other water related activities. Spa area for relaxation and muscle toning therapy.

**User description:** general public, private club members, and can be rented for special occasions.

**Critical issues:** very calm and relaxed setting but also one that encourages much participation.

**Furniture & Equipment:** all necessary water filtration systems, pumps, and heaters. Lounge chairs, CINZANO type canopies, small lockers, railings, ladders, diving boards, whirlpool hot spas.

**Lighting:** general illumination levels, natural lighting, pool lights, feature lights over vegetation and spa areas.

**Hvac:** general comfort levels, spot radiant heaters around pool, natural ventilation, prevent chlorine smells from entering other areas.

**Acoustics:** prevent water noises, pump and filter noises, and echoes from entering other areas.

**Location priority:** close to the water and sunning terraces.

**Views:** Selected views to opposite shorelines and coves.
4.2 SHOWER & LOCKER AREA
3,580 S.F.

Description: area for bathing and storage of clothes while at the beach or swimming pool.

User description: general public and club members.

Critical issues: discourage vandalism and prolonged visits, prevent odors from entering other spaces.

Furniture & equipment: toilets, urinals, showers, lockers, benches, lavatories, hair and hand dryers, soap and toweling dispensers.

Lighting: general illumination levels.

HVAC: good ventilation, general comfort levels, humidity control.

Acoustics: prevent noises from entering other spaces.

Location Priority: close to beach and swimming pool areas, not far away from swimming pool mechanical room.

Peak periods: Weekends from 10:00 A.M. to 6:00 P.M.

Views: not required, however hiding areas should not be developed.
4.3 RECREATION CENTER
3,840 S.F.

Description: area for general gaming and competitive entertainment.

User description: general public and private club members.

Critical issues: equipment theft and vandalism, conflicting game types require separation or zoning.

Furniture & equipment: lounge chairs and tables, video games, table tops with fixed game boards, billiard tables, ping-pong tables, vending and change machines.

Lighting: general and task lighting levels, natural lighting where glare does not pose a problem or interfere with games, feature lighting in appropriate areas.

HVAC: general comfort levels, controlled humidity levels, natural ventilation,

Acoustics: prevent noises from entering outside functions, zoning considerations for different concentration level games.

Location priority: near lounge and waterfront.

Views: To mooring and other shorelines where daydreaming is appropriate and conducive to concentration levels.
4.4 COCKTAIL LOUNGE
1,280 S.F.

Description: area for casual wining and
dining, a place to grab a quick bite to
eat while sitting in a pleasant setting.

User description: general public and
private members.

Critical issues: superb and spacious
seating arrangements, don't crowd tables
together, very calm and relaxed atmos-
phere.

Furniture & equipment: tables and chairs,
booths and benches, bar stools, bar
equipment, coolers, small grill, sinks
and storage racks, ashtrays, and planters:

Lighting: general and feature lighting,
creation of zones and different atmos-
pheres with different special lighting.

Hvac: general comfort levels provided
regardless of crowd size, adequate venti-
lation for smoke and odors.

Acoustics: subdued decible levels,
subdued bar noises, acoustical
zoning between bar and dining area.

Location Priority: near an entrance
by the waterfront, easy access to and
from the water.

Views: to mooring areas and distant
shorelines.
4.5 GENERAL DISCOUNT STORE
2,250 S.F.

Description: area for the purchasing of provisions necessary for marina and outing activities, also provided is an area for selecting books and other articles for classes given at the marina.

User description: a convenience center for sportsmen and the general public, also to frequented by those enrolled in classes.

Critical issues: well stocked and display areas for the rapid acquisition of provisions, good display techniques.

Furniture & equipment: display racks, storage and receiving equipment, cash registers, coolers, refrigerated display cases, carts and cart storage areas.

Lighting: general and task lighting.

Hvac: general comfort levels.

Acoustics: subdued sound levels, provide adequate background music.

Location priority: near the water and shoreline, also should be close to a major circulation area.

Peak Period: general continuous use.

Views: both to and from the water.
4.6 SPORTING GOODS STORE
2,500 S.F.

Description: area for the purchase of hunting and fishing equipment, bait store is provided as well as the services of a licensed taxidermist.

User description: hunters, fishermen, sailors, general public, anyone interested in the available sporting goods.

Critical issues: well stocked and rotating inventory.

Furniture & equipment: storage tanks for live baits, circulation and filtering equipment, display racks, storage and supply refrigerators.

Lighting: general lighting levels

Acoustics: subdued sound levels

Location Priority: close to waterfront and mooring area.

Peak Periods: opening days of the seasons according to what comes into season.

Views: should have views to and from the water and mooring areas.

Hvac: general comfort levels with special heaters for the live tanks.
4.7 BOAT & ENGINE SALES

2,500 S.F.

Description: display area and sales for 10 boats and accessories in the summer and snowmobile displays during the winter.

User Description: general public and interested parties.

Critical issues: close to the water to allow for trial runs.

Furniture & equipment: boat trailers, display cases, lounge chairs and coffee tables, refreshment vending machines, desks and chairs, calculators, filing cabinets, typewriter desks, display racks, portable lifts and tractors to move boats around.

Lighting: general and task lighting with some consideration for special effects.

Hvac: general comfort levels, space heaters near entrances during the winter, provide adequate ventilation in shop area.

Acoustic: prevent shop noises from entering the display areas.

Location priority: close to launching area.

Peak periods: seasonal and sales, main traffic and use during the weekends.

Views: to and from the waterfront.
4.8 CARETAKER & MAINTENANCE
3,000 S.F.

Description: area to house the staff which is responsible for the maintenance of the marina. Included in this area is a workshop and storage area for general repairs.

User Description: maintenance staff and supervisor.

Critical issues: not too dominant in the scheme, equipment storage and neatness mandatory, don't clutter walkways or detract from the beauty of the marina.

Furniture & equipment: storage lockers, power and handtools, provisions for truck storage, office equipment, desks, chairs, typewriter desk, credenzas, filing cabinets, and telephones with intercom capabilities.

Lighting: general lighting levels in the office areas with task lighting in the shop areas.

Hvac: general comfort levels with extra heavy-duty heaters in the shop area with automatic controls when doors are opened in the winter.

Acoustics: prevent high noise levels from leaving the shop area.

Location priority: close to the waterfront and near the dry-boat storage area.

Peak periods: before and after opening seasons.

Views: to the waterfront but this is not absolutely necessary.
4.9 MARINA OFFICE & INFORMATION CENTER
1,000 S.F.

Description: office for conducting the administrative duties of the marina and general information center.

User description: marina employees, mgr. asst. mgr., supervisor, two secretaries, and visits by the general public.

Critical issues: visitors should not be able to disturb the normal operation of the office.

Furniture & equipment: desk and chairs, typewriter desks, lounge chairs, filing cabinets, intercom system, storage areas, vending area near by, phone services, and drawing and chart storage cabinets.

Lighting: general illumination levels

HVAC: general comfort levels, with natural ventilation and humidity control.

Acoustics: separate internal office noises, prevent exterior noises from entering the office area.

Location priority: close to entrance, close to docking facilities, and near the waterfront.

Peak periods: normal business day and activities.

Views: to mooring area or distant shorelines.
4.10 BOAT REPAIR & MAINTENANCE AREA
2,000 S.F.

**Description:** area for hull and engine repair as well as general maintenance i.e. (hull cleaning, engine tune-ups, oil changes, and sail repair.).

**User description:** boat and engine mechanics, general public requiring such services.

**Critical issues:** because of its nature it is necessary to insure this area is well taken care of and not allowed to become an eyesore to the marina.

**Furniture & equipment:** hoists and cranes, tool and material storage bins and lockers, workbenches, cleaning tanks, fork lifts, desks and chairs, general office equipment.

**Lighting:** general and task lighting levels

**Hvac:** general comfort levels, special consideration for shop area.

**Acoustics:** noise levels kept to a minimum and kept from leaving the shop area.

**Location priority:** close to launching ramps and boat storage.

**Peak periods:** before and after opening season, weekends in the afternoon.

**Views:** to the waterfront.
4.11 STATUTORY SERVICES CENTER

1,000 S.F.

**Description:** this is the area in which boaters may replenish their supply of fuels and dispose of any rubbish before and after their excursions.

**User description:** general public and members moored at the facility.

**Critical issues:** much care must be taken for the storage of these chemicals as well as consideration for the storage of empty containers.

**Furniture & equipment:** general office equipment (desk, chair, filing cabinet, safe, calculator, storage cabinet). fuel pumps, storage racks for empties as well as for full containers.

**Lighting:** general and task illumination levels with special provision for H.I.D. lamps at the pump areas for use during the evening hours.

**Hvac:** general comfort levels, provide adequate ventilation in both the store-and in the office area to prevent the accumulation of fumes.

**Acoustics:** Attendant should be able to hear when customers arrive.

**Location priority:** near the water so boats can be fueled and serviced as they go in or come out of the water.

**Peak periods:** early morning and late afternoons.

**Views:** clear view of the service and ramp areas, also the station should be clearly visible from the mooring area.
RESTAURANT
7,600 S.F.

4.12A Dining and Lounge Area

Description: fine family meals served here in a relaxed and beautiful atmosphere, the lounge area caters to couples and groups not under a family type dining experience; this area caters more to the adult tastes and sophistication.

User description: general public; families and couples, and private club members.

Critical issues: the character of the space must be relaxed and yet sophisticated enough to attract a higher class of people without discouraging others.

Furniture & equipment: comfortable chairs, benches, tables, and bar stools, elegant lighting hardware.

Lighting: subdued and controlled lighting levels be-fitting the mood and time of day, feature and task lighting at the circulation and highlight areas.

Hvac: adjustable comfort levels, humidification control, air-freshening and odor control.

Acoustics: acoustical zoning from kitchen, bar, and adjacent tables.

Location priority: close to the central circulation space and lobby.

Views: views directed to opposite shorelines and the mooring area.
4.12 RESTAURANT (cont.)

4.12B Kitchen and Storage Area

Description: area for the receiving, storage, and preparation of food stuffs to be served in the restaurant.

User description: short order cooks, chefs, food preparers, dishwashers, waitresses, and general kitchen help.

Critical issues: care must be taken to provide an adequate facility which works well and is easy to maintain the highest standards as set forth by the board of health.

Furniture and equipment: meat preparation tables, vegetable preparation tables, kettles, deep fryers, ranges, fry grills, hot plates, dry and cold food storage collars, dishwashing and general clean-up utensils.

Lighting: general illumination levels with task lighting.

Hvac: general comfort levels taking into consideration heat generated by cooking and moisture, provide adequate ventilation.

Acoustics: protect adjacent areas from disturbing kitchen noises.

Location priority: adjacent to dining areas, receiving, and storage areas.

Peak periods: breakfast, lunch, diner, and late evening dinners.

Views: try to hide or at least make interesting the equipment so as to not be seen as an eyesore.
Description: this area is opened to the public for their own particular needs. This area will serve social organizations or cater to private parties. Space is also provided for businesses to hold conferences here and seminars, each room will have a small projection room.

User description: see above @ description

Critical issues: be sure to prevent this facility from disturbing other functions in the marina or surrounding rooms.

Furniture and equipment: folding tables and chairs which can easily be stored to accommodate large dance areas, service carts and banquet serving tables.

Lighting: General illumination levels, lighting controls for sections allowing for the presentation of movies or slides.

HVAC: general comfort levels, good ventilation for smoke and other odors, humidification control.

Acoustics: prevent noises from entering adjacent spaces.

Location priority: close to kitchen area, and lobby area.

Views: most activities are internally focused so views don't really become an issue here.
4.14 MUSEUM

5,600 S.F.

Description: this area is to be used to educate the general public on the historical aspects of sailing and other related activities. This area will include display areas, a workshop for the preparation of exhibits, a curator's office, and a display area in the entry lobby.

User description: this area is open to the general public and can take groups of people on special tours. The curator will have an office and two assistants will work in the shop area.

Critical issues: much care must be taken to prevent any unjust vandalism to any of the displays, in addition to this it must be remembered that the museum is to actually draw people inside for their further education on past sailing history.

Furniture & equipment: office equipment will include a desk, chair, filing cabinets, typewriter desk, and storage file. The workshop will provide adequate counter space. The display areas will have display cases designed in the workshop.

Lighting: general illumination levels, task lighting in the workshop, and feature lights in display areas.

Hvac: general comfort levels with special attention given to the humidification of the display areas.

Acoustics: due to large open spaces care must be taken to prevent unwelcomed echoes.

Location priority: next to lobby or main entrance.

Views: preferably to the waterfront however they can focus inward.
4.15 WEEKEND LIVING QUARTERS

32 @ 1,000 s.f. = 32,000 S.F.

Description: these are apartments which can be reserved for overnight stays at the marina. These rooms will provide the guest with all the luxuries of home.

User description: general public, private members, parties of more than 8 can reserve a whole level if so desired.

Critical issues: guest must have the feeling that their rooms are more than just another apartment.

Furniture & equipment: lounge chairs, tables, coffee tables, dressers, beds, night tables, television, radio, and bathing facilities.

Lighting: general illumination levels with track lighting for special effects and highlighting architectural interior spaces.

Hvac: general comfort levels with plenty of natural ventilation.

Acoustics: care must be taken to insure the guest privacy therefore sound transmissions through the walls must not be allowed to occur.

Location priority: close to the water and beach area, also close to the circulation areas leading to the entertainment areas of the marina.

Views: directed to the water and beach areas as well as the mooring area.
4.16 BOAT OWNERS' LOUNGE

4,000 S.F.

Description: this is a private dining and lounge area which will serve high quality foods in a relaxed and casual atmosphere.

User description: this area is for private club members of the marina. However at the discretion of the members the facility may be opened to the general public. The sole intention of this place is to encourage more participation in the marina complex.

Critical issues: the space must be very attractive to the potential member. One must feel that he is part of an elite crowd and have a feeling of pride in this facility.

Furniture & equipment: comfortable chairs and dining tables, booths and booth type seating, bar stools.

Lighting: subdued and controlled lighting levels be-fitting the mood and time of day, feature lighting and track lighting along circulation areas.

Hvac: adjustable comfort levels, humidification control, air-freshening and odor control.

Acoustical: acoustical zoning from kitchen, bar, and adjacent tables.

Location priority: close to central circulation space and lobby.

Views: views directed mainly to the mooring area so that members may indicate their boat during discussions.
4.17 COMMITTEE & CLASSROOMS

4 @ 900 s.f. = 3,600 S.F.

Description: these rooms will be used for meetings, general discussion, and for the giving of lectures and presentations for classes taught at the marina.

User description: this area will be open to social organizations for holding meetings or for community activities, students will also utilize these spaces while attending classes at the marina.

Critical issues: these are not to be jail cells! These rooms must have an atmosphere conducive to the educational experience.

Furniture & equipment: desk and chair, lecture podium, folding or stackable combination chair and desks, projector screens, chalkboards, movable partitions so spaces may open into the other room.

Lighting: general illumination levels, reduce the potential of glare.

Hvac: general comfort levels, natural ventilation.

Acoustical: sounds must not transmit into the other rooms.

Location priority: close to the library and to the water for outdoor instruction.

Views: not to be distracting but allow for some visual release.
Description: this area will house all the necessary literature addressing such items as: sailing, fishing, boating, and other related water and sporting activities. This will be the area in which one can go to in order to educate oneself to the available pleasures to found around the water.

User description: one librarian and three assistants will insure that the general public will have an enjoyable and informative experience in this facility.

Critical issues: the library should be easy to use and contain an atmosphere which will be relaxing to the visitor.

Furniture & equipment: stacks, projection room., magazine racks, tables and chairs, lounge chairs, card catalogs, layout tables, counter space.

Lighting: natural lighting without the glare, general illumination levels, feature lighting for special displays.

HVAC: general comfort levels, humidity control for the protection of books.

Acoustical: prevent noises from being transmitted throughout the space so as to reduce the chance of disturbing someone.

Location priority: close to the class rooms and exterior terraces.

Views: provide from outdoor terraces to the distant shorelines and beach and mooring areas.
5.0 SPACE SUMMARY
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SWIMMING POOL & SPA AREA......5,000 s.f.
SHOWER & LOCKER AREA.........3,580 s.f.
RECREATION CENTER.............3,840 s.f.
COCKTAIL LOUNGE...............1,280 s.f.
GENERAL DISCOUNT STORE........2,250 s.f.
SPORTING GOODS STORE..........2,500 s.f.
BOAT & ENGINE SALES............2,500 s.f.
CARETAKER & MAINTENANCE.......3,000 s.f.
MARINA OFFICE & INFO CENTER...1,000 s.f.
BOAT REPAIR & MAINTENANCE.....2,000 s.f.
STATUTORY SERVICES CENTER.....1,000 s.f.
RESTAURANT.....................7,600 s.f.
BANQUET & COMMITTEE ROOMS.....3,800 s.f.
MUSEUM..........................5,600 s.f.
WEEKEND LIVING QUARTERS.......32,000 s.f.
BOAT OWNERS' LOUNGE............4,000 s.f.
MEETING & CLASSROOMS..........3,600 s.f.
LIBRARY..........................6,000 s.f.
6.0 SPACE RELATIONSHIPS
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- SWIMMING POOL
- SHOWER & LOCKER AREA
- RECREATION CENTER
- COCKTAIL LOUNGE
- GENERAL DISCOUNT STORE
- SPORTING GOODS STORE
- BOAT & ENGINE SALES
- CARETAKER & MAINTENANCE
- MARINA OFFICE & INFO
- BOAT REPAIR & MAINTENANCE
- SERVICE CENTER
- RESTAURANT & LOUNGE
- BANQUET & COMMITTEE RMS.
- MUSEUM & DISPLAY
- WEEKEND LIVING QUARTERS
- BOAT OWNERS' LOUNGE
- MEETING & CLASSROOMS
- LIBRARY

- STRONG RELATIONSHIP
- SOME RELATIONSHIP
- NO RELATIONSHIP
7.0 BUILDING CRITERIA
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7.1 General: The building constructed on this site of the marina constitutes one of the main features of the created harbor. A well planned building of appropriate style, located in a carefully arranged and landscaped settings, will add much to the charm of the marina.

A great majority of the people who approach the marina from the water probably are affiliated with some distant club or organization. On the other hand, many visitors from the landward approach may be potential future boat owners. In order to encourage them to enter into the sailing scene a beautiful setting should be provided.

7.2 Functions: The building has six major functions which are combined to create a unified whole. These functions include recreational, educational, retail, entertainment, social & community, and service facilities.

7.3 Flexibility: There is little flexibility in the recreational and entertainment facilities because space requirements for game and table layouts are well fixed. However, in the retail, educational, and social facilities the spaces are very flexible and have the ability for many interior changes to suit the desired activities.

7.4 Circulation: Should be simple, logical, uncomplicated, with efficient egress routes. All doors should swing in the direction of emergency routes. Circulation should be kept at the back of the house so as not to interfere with views.

7.5 Building core: Mechanical shafts for heating and air-conditioning. Common plumbing wall and stacks, elevators and stairwells.
7.6 Expansion capabilities: Expansion can occur on either end of the marina. Vertical expansion is limited to the central core area.

7.7 Economic efficiency: Energy conscious design, low maintenance building material, orientation for solar potential, provide overhangs for summer screening, incorporate berming and vegetation to help in this area, all glazing should be triple glazed windows.

7.8 Security: All function which do not remain open 24 hours a day will be locked. Circulation will remain open but major entry only occurs through the second level lobby.

7.9 Design criteria: The following material is intended as a guide or reference point from which specific design solutions can be established. Absolutely no attempt is made in this program to present the final design solution or final aesthetic expression.
1. Lobby or lounge
2. Dining room
3. Kitchen
4. Food storage and preparation
5. Dishwashing and storage
6. Dance or assembly room
7. Office
8. Men's toilet, shower, and locker room
9. Women's toilet, shower, and locker room
10. Enclosed veranda
11. Loading platform
12. Snack bar
13. Kitchen and food storage
14. Chart room
15. Closet room
16. Women's rest room
17. Men's rest room
18. Observation deck
19. Board room
20. Dumb waiter

*Note: Figures shown thus 12 to 30 refer to the number and maximum size of boats that can be safely accommodated in the slips so marked.*

2. Arrangement providing both commercial and social activities.
### Floor Space Allocations (sq ft)

#### Social Activities Buildings

<table>
<thead>
<tr>
<th>MARINA NO</th>
<th>Doors in fleet</th>
<th>Lounge or lobby</th>
<th>Dining room</th>
<th>Kitchen</th>
<th>Food storage &amp; preparation</th>
<th>Dishwashing &amp; dishwasher</th>
<th>Tenant lounge</th>
<th>Mens' toilets &amp; showers</th>
<th>Womens' toilets</th>
<th>Mens' locker room</th>
<th>Womens' locker room</th>
<th>Enclosed lounge</th>
<th>Loading platform</th>
<th>Snack bar</th>
<th>Kitchen and food storage</th>
<th>Chart room</th>
<th>Closet room</th>
<th>Mens' rest room</th>
<th>Womens' rest room</th>
<th>Observation deck</th>
<th>Boardroom</th>
<th>Dumbwaiter</th>
<th>Furnace room</th>
<th>Miscellaneous</th>
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#### Sales and Service Buildings

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*Fig. 5: Marinas activities buildings.*
8.0 EXTERIOR CRITERIA

8.1 General: The fixtures on the shore comprise the visitors' headquarters, office, place of contact with fellow boat owners, and his medium for relaxation. Just as much care shall be taken in the design and consideration of this aspect. This particular set of parameters can either make or break the success of the project.

8.2 Parking: Adequate parking should be provided in a way that would be harmonious to the site and building. Parking should be as convenient as possible. Parking should be integrated with landscaping in such a way that when entering the site a pleasant sequential experience may be enjoyed. Users should be able to make a speedy exit to parking area with as little congestion as possible. Easy access to major traffic routes must be considered. Parking surfaces must have good drainage.

8.3 Mooring & berth area: Provide adequate mooring for large craft as well as smaller boats. Be sure that manoeuvring will not be a problem. Mooring areas should be exciting as well as a functional operation. Much care should be taken to create a sense of place and personal pride.

8.4 Piers & Walkways: Provide immediate and easy access to mooring areas. Special care must be given to surface treatment of the walkways. They should be non-slip surfaces and have a maximum of aesthetic appeal. Provide areas along the way for fishing or just plain relaxing. Think of alternating patterns and how they may be viewed from other marina areas.

Promote interest by level changes, patterning, color, robust nautical character, avoid large flat areas of plain surface materials.
8.5 Statutory Services: These items are for the convenience and safety for the boaters. Their arrangements should be well thought out and readily available.

Electrical services, fire and water services, lighting and telephone services will be located along the walkways and mooring areas.

8.6 Launch & Boat Handling: Design adequate vehicular access and manoeuvring space. Owners should be able to have little difficulty in retrieving of putting boats in the water. This area will also attract curious spectators and should be easy to maintain to present a clean and efficient launching area.

8.7 Bunkering Facilities: This facility will provide fuel, bottled gas, and sewage disposal services. Although it is a service it should nevertheless be efficient and safety cautious. Care must be taken to insure its' aesthetic properties as well as convenience. Fire prevention is also a major concern.
5.10 Some of the main activities which generally need to be included within a marina.

5.11 How a draft amenity outline could be developed into a basic layout.
Method

a Parked = 7.620 m x 2.438 m + 1.210 m clearance on two sides (25° x 8° + 4°)
   = 8.830 x 3.650 (29° x 12°)

Parked with car, clearance on two sides = 14.935 x 3.658 (49° x 12°)
stacked = (two levels)
   = (three levels)

Surface area (approx.)
32.33 m² (348 ft²) = 375/ha (150/acre)

b Moored between piles
   = loa + min. of 1.524 (5°) at each end of the craft
0.610 (2°) beam clearance and 0.09 (1 ft)
piles in this example
   = 11.278 x 3.048 (37° x 10°)

34.37 m² (370 ft²) = 325/ha (130/acre)

c. Swinging moorings or trots
   Largely determined by the heights of the tides, which in turn determine the length
   of the cable or mooring line. Tidal range has been averaged at 4.570 (15°). The length
   of the cable is 3 or 4 times the depth, i.e.
   13.710 (45°). The craft is then free to swing within this sector which has a
   13.710 + 7.620 = 21.330 (45° + 25° = 70°)
radius, giving a spatial allowance of
   176.51 m² (15,400 ft²) = 7.5/ha (3/acre)

d. Anchored (portable)
   Length of cable in this case is not only determined by the depth of water but also
   by the type of anchor, boat and sea bed: it varies from 4 to 6 times the depth of the
   water. For this example assume 4.570 (15°)
depth x 5 = 10.480 (100°) radius within
which the craft is free to swing.
   371.91 m² (31,422 ft²) = 3.75/ha (1/acre)

e. Berthed
   In a marina type of development or alongside a pier or jetty. The spatial
   allocation is similar to that for parked craft.
   allowing 0.152 (6°) either side of the beam
   for tenders and half the width of the catwalk in the case of a 7.620 (25°) boat this
   would average 1.219 (4°) on the length and
   0.610 (2°) on either side, = 9.144 x 3.658
   (50° x 12°). Allowing for clearances, piers, etc.
   31.45 m² (360 ft²) = 302/ha (121/acre)
   = 125/ha (50/acre)
5.81 Below: Layout and construction drawings to illustrate typical arrangements for both fixed and floating pier systems. Both types of pier cater for a tidal range of 1.829 m (6').

- **Floating**
  - **T-HEAD LANDING**
  - **WALKWAY**
  - **Finger piers**
  - **Anchor pile and guide**

- **Boats**
  - 6100 to 6930 (20') 12' (26')
  - 3650 (12')
  - As above 3650 (12')

- **Boats**
  - 4880 to 6100 (16') (20')
  - 3050 (10')
  - As above 3050 (10')

- **Transitional berth**
  - 2750 (9')

- **Boats under 4880**
  - (15')
  - 2750 (9')
  - As above 2750 (9')

- **6100 (20')**
  - 2400 7300 (24')
  - 9150 (30')

- **WALKWAY**
  - 2440 (8')

- **DETACHABLE FINGER PIER**
  - 3050 (10')
  - 2440 (8')

- **Services**
  - Continuous 100 x 150 (4' x 6') fender
  - Protection skirt
  - Rigid foam flotation billets
  - Diagonal bracing
  - Removable deck sections

- **Location of mooring hardware**
  - 2300 (7.5')
  - 1370 (3.5')
5.84 Various types of floats and linkages
8.2 Cross-section through paved footway showing arrangement of public utility services and minimum depths and spacings between services recommended in MPBW R & D bulletin.

8.3 Cross-section through common trench for public utility services recommended in MPBW bulletin. The trench would be back-filled in three stages as indicated. Depths of cover for sewers will vary and the local authority will need to be consulted. For land drains cover will vary between 0.700 m to 1.200 m depending on soil type.
9.0 SITE CRITERIA

9.1 General: The site is located at the Hanna Creek Ramp which is an existing boat launching area on Brookville Lake in Brookville, Indiana. Brookville Lake is located 36 miles N.W. of Cincinnati, Ohio. Hanna Creek Ramp is located on the east bank of the lake where Dubois and Hanna Creek enter the lake.

Access is provided by Bossert Rd. (County Rd. 600 S.) which leads directly to the site. State Road 101 is the only major highway leading to Bossert Rd. however, access to State Road 101 is provided State Road 1 and 44 and by US Route 52 and 27.

The lake is 5,260 Acres in the summer. The lake runs North and South with lengths of 10.5 miles in the winter and 15.5 miles in the summer.

The area surrounding the lake is bountiful in deciduous trees and coniferous vegetation taking root in gentle to moderately rolling hills. The area in the outlying districts are agricultural in nature.
EXISTING FACILITIES

FOOT PATHS
PICNIC AREAS
BOAT RAMP
CAR & TRAILERS
RESTROOMS
PARK ROAD
MAJOR TREES
Minor trees
BROOKVILLE LAKE
N
EXISTING VIEWS

DESCRIPTION OF VIEWS
1. Nice View Over Water & Shore
2. Picturesque Farm & Shoreline
3. Pleasant View of Moored Ships
4. Good View of Point & Rock Cliff
5. Nice View of Fishing Cove & Ships
6. Beautiful View of Shoreline
EXISTING ACTIVITY NODES

- SAILING
- FISHING
- BOAT LAUNCH
- PICNIC
- BOAT RACING

LEGEND

ACTIVE
PASSIVE
SUMMER WINDS

BROOKVILLE LAKE

N
SUN PATH DIAGRAM 40° N. LAT.
DRAINAGE

BROOKVILLE LAKE
10.0 BUILDING TYPES ANALYSIS

10.1 General: This analysis was undertaken in order to familiarize myself with the many and varied concepts which were used to create a well functioning marina. This study was only intended to make known to me some of the basic concerns of marina design and had no intention of dictating my own concerns. I have taken thoughts from other designers; digested them; and have arrived at basic assumptions which will lead me through the design process.

10.2 Basic Concepts & Relationships:
One of the major concepts which seem to have developed concerns the manner in which the marina and mooring area relate. The marina either runs along the shoreline; juts out into the mooring area and lets mooring surround it; or the marina wraps around the mooring area giving shelter to the boats.

10.3 Conclusion: For the most part it seems that a very strong relationship exists between the marina and mooring; but it goes a little farther than this. Depending on what type of visitor one wishes to accommodate will normally dictate the proximity of the functions to the water, i.e., if the marina is seen as very active and must launch many ships then the other functions seem to rise above and let the service area have priority.
PORT MADOC HARBORSIDE, GWYNEDD, WALES

* Housing development built to represent a historic coastal village.
* Housing extends out into the mooring area, and is bordered on the west with circulation and launching area.
* Parking is located in the center of the housing complex.

* Views are directed out to the water, a park in the center of the complex, and to the boat launching slipways.
BOATING COMPLEX, LAKE WINNEMERE at BOWNESS
LAKE DISTRICT, NORTH ENGLAND

* Different functions in a single complex; use of pitched roofs and traditional materials.
* The marina/docks are drawn into the complex with commercial areas on two sides, services and administration are on the other side on the first level.
* Lack of organization in space arrangements.
* Parking is placed along the waterfront.

* The first and second level are occupied by a restaurant with commercial and office space.
* Circulation and views are focused on and directed around the marina and docks.
* Public spaces overlook parking.
* Building lacks a massing vocabulary.
* Building illustrates no concern for scale.

LAKE WINNEMERE

PARKING

MOORING

HORIZONTAL CIRCULATION
SERVICES & ADMINISTRATION

VERTICAL CIRCULATION
COMMERCIAL
CHERRY CREEK MARINA, DENVER, COLORADO

* Creation of visual reference points. Buildings are constructed out of concrete with orange roof lines resembling sails.
* Clear indication of function as home base. Concrete sails lend a sculptural effect to a featureless shoreline.
* Creation of small urban spaces by their arrangement.

* An extension of the bordering urban center.
* Linear circulation winding around the spaces.
* The public facilities are somewhat limited.

CHERRY CREEK RESERVOIR

MOORING
PARKING
HORIZONTAL CIRCULATION
ADMINISTRATION
CONCESSIONS
SERVICES
* To uphold the sailor tradition the clubhouse is styled after the "ginger bread barns" of past clubhouses.
* A central kitchen is set up to serve a variety of dining and snack areas.
* The main rooms can be divided by movable walls.

* The trophy lounge and upper level rooms offer a retreat from the bustle and activity of the docks and main rooms.
LAUREL POINT, VICTORIA BRITISH COLUMBIA, CANADA

* A cluster of four buildings with a central promenade leading to the mooring area.

* Hotel with cabaret and meeting rooms are centrally located with views to the water.

* Complex set back from the water with a waterside promenade in front.

* Hotel suites and townhouses front the water while recreational and entertainment facilities are set back.

* Views are directed towards the water and parking and vehicular circulation are kept out of view.

VICTORIA HARBOR

HOTEL SUITES TOWNHOUSES

DINING/BALL ROOMS CONDOMINIUMS

HORIZONTAL CIRCULATION

PARKING
ADMINISTRATION BUILDING, SHILSHOLE BAY
MARINA, SEATTLE, WASHINGTON

* First level devoted to the boaters, and the second level caters more to dining and commercial facilities.
* Central axis leading to the mooring area
* Strong connection between parking with the aid of a bridge to second level dining facilities.

* The building is placed between the mooring and parking areas to encourage visitors to first pass through the complex.
* Service areas are kept to the landward side.
11.1 General: The marina/resort is contained within three levels made up of two wings set at a $45^\circ$ angle to each other. This allows them to conform to the sites topography.

11.1A The first level is eight feet above the water level and contains all the retail, services, and recreational functions.

11.1B The second level, which is the level of entry from the landward side, contains the dining and lounge facilities, the lobby, and guest rooms.

11.1C The third level contains the private lounge and meeting rooms, the mechanical room, and more guest rooms.

11.2 First Level

11.2A This level is eight feet above the water because of a seasonal water level fluctuation.

11.2B The recreation center and swimming pool area protrude out into the mooring area accentuating the importance of these functions and defining three major entries at water level.

11.2C The entrance on the northwest brings people from the mooring area, through the marina/resort, past the recreation center to the west and swimming pool to the east, to the main circulation strip.

11.2D The entrance on the east bring visitors from the mooring area past the retail shops and boat display, to the main circulation strip.

11.2E The entrance on the west bring visitors from the beach area, past future retail areas, to the main circulation strip where they may enter the bathhouse.

11.2F Once in the main circulation strip visitors may enjoy the facilities or proceed to the central, vertical circulation and ascend to the second level.
11.2G The recreation center is placed between the beach area and swimming pool to allow views to the beach or swimming pool. Also, the swimming pool is to act as a magnet drawing people from the beach area through the recreation center.

11.2H People coming from east mooring areas must pass by all the retail shops to get to the second level. This gives retail shops maximum exposure and are close to the mooring area for the quick acquisition of needed supplies.

11.2I The bathhouse and snack bar are located where they can serve both the beach and pool area.

11.2J Surrounding the first level is a waterfront esplanade and sun bathing terrace. Along this walk are provided casual seating areas for relaxation or fishing. Each are covered by canvas canopies hinting at sail motives with well landscaped vegetation.

11.2K To the back of the first level is the receiving and storage area. These are kept to the back to prevent them from disturbing views and obstructing circulation.

11.2L Vertical circulation consists of two elevators and two escalators.

11.3 SECOND LEVEL

11.3A The southern entrance leads landward visitors into the lobby area where they are first introduced to the marina/resort. Here a spectacular view overlooking the swimming pool to the mooring area encourages visitors to the first level. However, they may wish to register at the front desk insuring them a room for the night.

11.3B The second level contains all the dining and lounge facilities, a library, and guest rooms.

11.3C The restaurant is projected over the recreation center giving diners
excellent views of the beach, mooring, and pool area. The lounge views only to the beach area.

11.3D The kitchen is centrally located to provide service to the restaurant, lounge, and banquet rooms which can open up and provide a dance floor or extra dining accommodations.

11.3E The library looks into the pool area and out to the mooring area providing pleasant views for the libraries casual reading area.

11.3F The guest rooms are oriented to give magnificent views to the mooring and beach area and to maximize natural ventilation and solar exposure. The circulation corridor is actually an atrium, adding to the character of the space, allowing the marina to offset the high fuel bills during the winter. The guest rooms are separated in two wings to break the monotony of a long corridor plus giving interested parties the option of reserving a whole floor for special outings or mini-conventions.

11.4 THIRD LEVEL

11.4A The third level contains all the private club functions, mechanical room, and more guest rooms.

11.4B Private club functions include a boat owners' lounge and a committee room. The lounge is located to provide views to the mooring area where members may view each others' boats as a catylist to conversation. The committee room, which is intended for meetings, can open up giving the lounge an opportunity to accommodate larger crowds.

11.4C The guest rooms project over lower guest rooms providing the same quality lodging. However, guest rooms have also been extended over the restaurant area to provide views to beach and pool area.

11.4D The mechanical room is centrally located to reduce HVAC costs.
12.0 DESIGN DEVELOPMENT
12.1 Major Changes:

12.1A The swimming pool and recreation center have switched places creating a stronger relationship between the beach and swimming pool. Also the bathhouse serves both areas better.

12.1B A lounge has been added to the front of the recreation center which allows visitors to gain immediate access from the mooring areas to get a drink or a quick bite to eat.

12.1C A playground has been added to act as a beach area for the swimming pool allowing parents to enjoy the pool or hot-tubs while children amuse themselves.

12.1D A more appropriate and functional central circulation core has been developed. A circular stairway has been pushed out into the central area acting as a point of familiarization to existing marina facilities. The escalators have been removed because the character of the space invites a more casual ascension to the second level.

12.1E Retail areas have been given a more logical front to the circulation area. It's less confusing and gives retailers more public exposure.

12.1F The lobby on the second level has become more organized and makes the transition from land to water more exciting and dynamic.

12.1G The restaurant, lounge, banquet rooms, and kitchen have replaced the library; which has moved to the third level, and gives patrons even more exciting views to the mooring and distant shorelines.

12.1H A museum has been added to the second level with a display area in the
lobby. This adds more nautical character to the space and educates as well as excites the visitor.

12.1 I Circulation to the guest rooms has also been improved. It has become more direct and sequential as it decreases in size while one walks to his room. Also the atrium glazing has been changed to stand perpendicular to the corridor to improve views to the landward side of the marina.

12.1 J The library, which has moved up from the second level, makes the third level even more private. It has assumed a new configuration and more functional internal organization. Views are directed out to the water and distant shorelines. An added feature is a deck area which allows readers to enjoy the outdoors.

12.1 K The boat owners' lounge has been moved out over the restaurant area giving members even more spectacular views. A more functional kitchen has developed.

12.1 L The committee rooms, once intended for private member use, has now been added another function. The members still have first priority over these spaces but the rooms are also to act as classrooms used only during the week days.

12.1 M A new and exciting addition comes in the form of a "theme lounge" perched at the fifth level (skipping the fourth) supported by the three vertical circulation cores. This added feature is sure to guarantee the success of the marina. It is intended for nightly, sophisticated, adult entertainment. Views will be far more than spectacular and the character of the space will attract many clientele.

12.1 N Looking from the south the marina elevation appears very simple and right so. The primary purpose of this facade is to absorb solar heat during the winter and provide views from the interior corridors. The stairwell towers break up the facade and act as visual anchoring
devices to keep the marina from floating adrift. The "theme lounge", with its tall supports, further emphasises this anchoring and at the same time indicates the location of the major central space and defines the point of entry.

12.10 The north facade conjures up an entirely different reaction. The guest rooms with their long overhangs and deep shadows remind the sailors of caves as they approach the mooring area. The stair towers have lost their importance and remain faint in the background. The restaurant, lounge, and swimming area protrude out into the water clearly indicating the entrances coming from the mooring area. As the people on the upper decks become visible the sailor knows they have reached a safe port.
NORTH ELEVATION

SOUTH ELEVATION
13.0 FINAL DESIGN

13.1 Major Improvements

13.1A. Apartments now have immediate access to mooring and beach areas with the introduction of a stairway at the end of their corridors. No longer do guests have to walk to lobby area to gain access to the first or third level.

13.1B. The central circulation area now contains casual seating areas with fountains, and sculptures to encourage visitors to lounge around and take their time as they move from one space to another.

13.1C. The swimming pool area is now covered with an air supported roof structure. The space, two stories high (32'-0"), is glass enclosed at the two entrances to prevent unwanted chlorine odors from entering the other spaces. The air structure also allows the maximum level of natural lighting into the space.

13.1D. Retail display areas have become more effective through their simplification. As one approaches the central area, retail spaces pull back into a cove, so to speak, which keeps patrons from being distracted by the activities going on in the central area.

13.1E. The first level lounge has now developed a more centralized interior which focuses mainly on the mooring area as opposed to focusing on both the mooring and central circulation space.
1. Towel Check
2. Bathhouse
3. Laundry Room
4. Clothing Retail
5. Sporting Goods Store
6. Discount Store
7. Boat Sales
8. Marina Office
9. Information
10. Fueling and Disposal
11. Recreation Center
12. Mooring Lounge
13. Swimming Pool and Spas
14. Children's Playground
15. Weekend Living Quarters
16. Museum
17. Display Lobby
18. Marina Lobby
19. Reception and Office
20. Banquet Rooms
21. Committee Rooms
22. Kitchen
23. Restaurant
24. Maid and Janitor Storage
25. Library
26. Meeting Rooms
27. Private Banquet
28. Private Kitchen
29. Boat Owners' Lounge
30. Theme Lounge
31. Mechanical and Pump Room
14.0 APPENDIX
15.0 BIBLIOGRAPHY
15.0 BIBLIOGRAPHY


PERIODICALS

* Naval Architecture: CFB Ship Repair Unit, Arch 24:39-41 D'79


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* Yacht Club Redesign: Ar Nov.'78, pg. 94-95

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* Yacht Club: AA Feb.'62 pg. 154-57

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