



VILLAGE OF MAMARONECK
HARBOR MANAGEMENT PLAN

FINAL REPORT

VOLUME II: APPENDICES

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FINAL REPORT

VOLUME TWO

APPENDICES

Prepared By

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August, 1986

HARBOR MANAGEMENT PLAN

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PART 2

VILLAGE OF MAMARONECK
HARBOR MANAGEMENT PLAN

PART TWO

I. INTRODUCTION

A. BACKGROUND

In 1972, the United States Congress passed the Federal Coastal Zone Management Act, which called on states to develop coastal management programs and made federal money available for that purpose. New York State passed the Waterfront Revitalization and Coastal Resources Act in 1981 and, in 1982, adopted a State Coastal Management Program. The State legislation offers municipalities the opportunity to develop local coastal management programs and makes some federal money available for that purpose.

In anticipation of this action by New York State, the Village of Mamaroneck moved forward in 1979 to form the Coastal Zone Management Committee, a 30-member, broadly-representative citizen group which was chaired jointly by Mayor Suzi Oppenheimer and Village Manager Armand Gianunzio. With a grant of \$5,000 in "seed money" from New York State, the Committee developed the Coastal Zone Management Program - Phase One - January 1981 report, Daniel Natchez & Samuel Yasgur, Editors. This report (hereafter, "Phase One Report") inventoried coastal conditions in the Village, identified particular issues and opportunities of special importance, and recommended that a permanent commission be established to develop proposals for specific actions.

In 1982, as the State coastal management program was approaching adoption, the Village passed a Local Law No. 30-1984 which established a permanent Coastal Zone Management Commission, identified the same issues as in the Phase One Report, and directed the Commission to recommend actions to preserve the Coastal Zone.

In May of 1983, the Village entered into a contract with the Department of State of New York State for the preparation of a Local Waterfront Revitalization Program. The project was to be funded jointly by the Village and the State, providing for \$20,000 in federal funds to be matched by the Village with a combination of monies and services-in-kind - for a total project cost of \$40,000. The result of this effort was the "Local Waterfront Revitalization Program" which identified several development, recreation, public access and water/air resource policies to be implemented through

such techniques as amendments to local laws, establishment of management structures and the completion of additional studies.

In its endeavor to implement the endorsed policies of the Village Coastal Zone Management Plan as embodied in the "Local Waterfront Revitalization Program", the Village of Mamaroneck is developing this Harbor Management Plan. As part of this Plan, the Village has enacted Local Ordinance No. 21-1985 which restructured the Village Harbor Commission, broadening its roles and responsibilities.

B. THE HARBOR COMMISSION

According to Local Law No. 21-1985, the Harbor Commission has three main roles to assume. Its first role is that of Advisor to the Village Board of Trustees on matters of Harbor safety and security. These matters, which are embodied in Chapter Nine of the Village Ordinances, Harbor and Watercraft, include such issues as operation of boats in the harbor, living on boats, discharge of sewage and litter as well as the allocation of mooring spaces and appropriate mooring procedures.

The second and newly expanded role of the Harbor Commission is that of Regulator of Private Development in Mamaroneck Harbor. In this role, the Harbor Commission has the responsibility to review building applications for the construction or reconstruction of marine structures, breakwaters and bulkheads in Mamaroneck Harbor. It has the right to deny the granting of such permits if it determines the proposed structure to be inappropriate with respect to its method or manner of construction, to be in conflict with its Harbor Management Plan, to constitute a navigational hazard or to have negative environmental consequences.

The third and final role of the Harbor Commission is that of Overseer of the Village Marina, Launching and Hauling Facilities. In this role, the Harbor Commission has the responsibility to review the need for the repair and/or reconstruction of existing public facilities, the need for the construction of additional facilities, the regulations governing the use of public facilities as well as the budget for the operation and maintenance of these facilities.

These three roles of the Harbor Commission - Advisor on Harbor Safety and Security, Regulator of Private Development and Overseer of Village Marina, Launching and Hauling Facilities - give the Harbor Commission the power to control the development of Mamaroneck Harbor so that the Village Coastal Zone Management policies, as identified in the "Local Waterfront Revitalization Plan", can be implemented.

It is the goal of this Harbor Management Plan to provide the Harbor Commission with the necessary information and guidelines so that they might fulfill their roles and responsibilities.

II. FEASIBILITY STUDY OF HARBOR CAPACITY

A. INVENTORY OF EXISTING FACILITIES

According to Local Law No. 21-1985, the Village of Mamaroneck Harbor includes "...all navigable waters, inlets, bays and coves, to a mean high water mark, within the limits of the Village of Mamaroneck and for a distance of 1,500 feet from the Village boundary, as such waters are designated on the Official Map of the Village of Mamaroneck" (Local Law No. 21-1985, Section One).

An aerial photograph of Mamaroneck Harbor was flown during the summer of 1982 as part of the Westchester County Dredging Study. The development in the Harbor, identified as of 1982, was updated through an on-site inspection of the Harbor with the Village Harbor Master in November 1985 and through review of building permit applications since 1982. On the basis of this information, a base map of the Harbor, which depicts the Harbor, current physical development and moorings, has been prepared (See Figure II.1, Village of Mamaroneck Harbor, Base Map).

As an overlay to this base map, a U.S. Army Corps of Engineer map identifying the existing Federal channels, Federal anchorage areas and Federal pier and bulkhead lines has been secured. In addition, through discussions with the U.S. Army Corps of Engineers, the revised Federal channel and anchorage areas, pending approval of the U.S. Congress, have been identified. (See Figure II.2 - Village of Mamaroneck Harbor, Federal Channel, Anchorage Areas and Pier and Bulkhead Lines.)

Finally, the Harbor inventory completed in the "Local Waterfront Revitalization Plan" identifying tidal wetland areas, shellfish concentration areas, swimming areas, transient mooring areas, public access area, historical areas and critical environmental areas has been depicted on a second overlay of the Harbor base map. (See Figure II.5 - Village of Mamaroneck Harbor Water Uses.)

Utilizing these map overlays, it is possible to identify areas of the harbor available for future development. These aerial maps have also been provided to the Harbor Commission as tools to evaluate the development proposals throughout the Harbor.

B. CAPACITY ANALYSIS

The capacity of Mamaroneck Harbor to accommodate boating is dependent upon many factors. There are basic physical variables such as boat sizes and available surface water

MAMARONECK

US ROUTE 1

RYE

VILLAGE OF
MAMARONECK

EAST BASIN

VAN AMRINGE POINT

HARBOR ISLAND

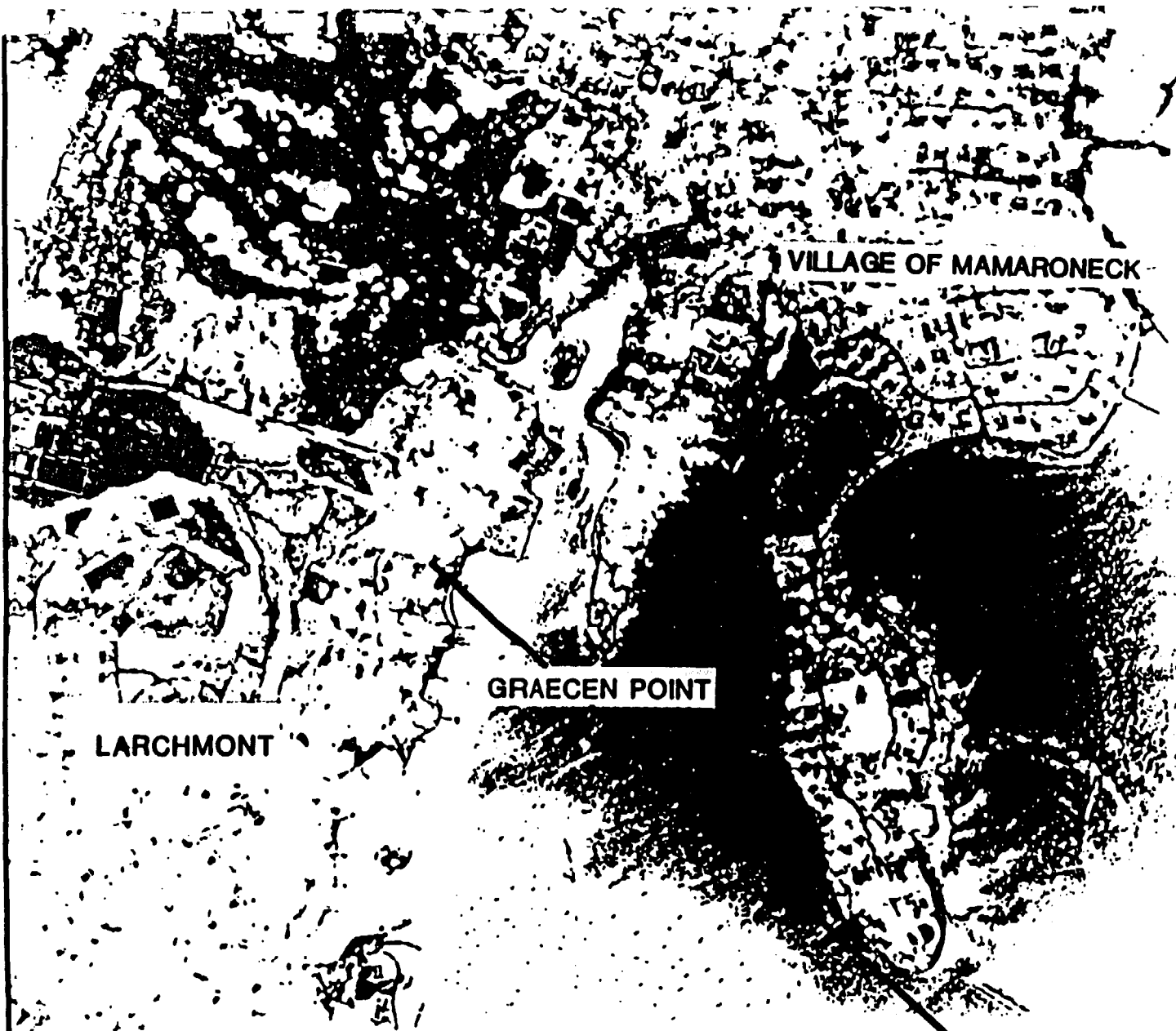
SHORE ACRES
POINT

WEST BASIN

ORIENTA POINT

729

4



APPROXIMATE 1500'
MAMARONECK HARBOR
JURISDICTION LINE

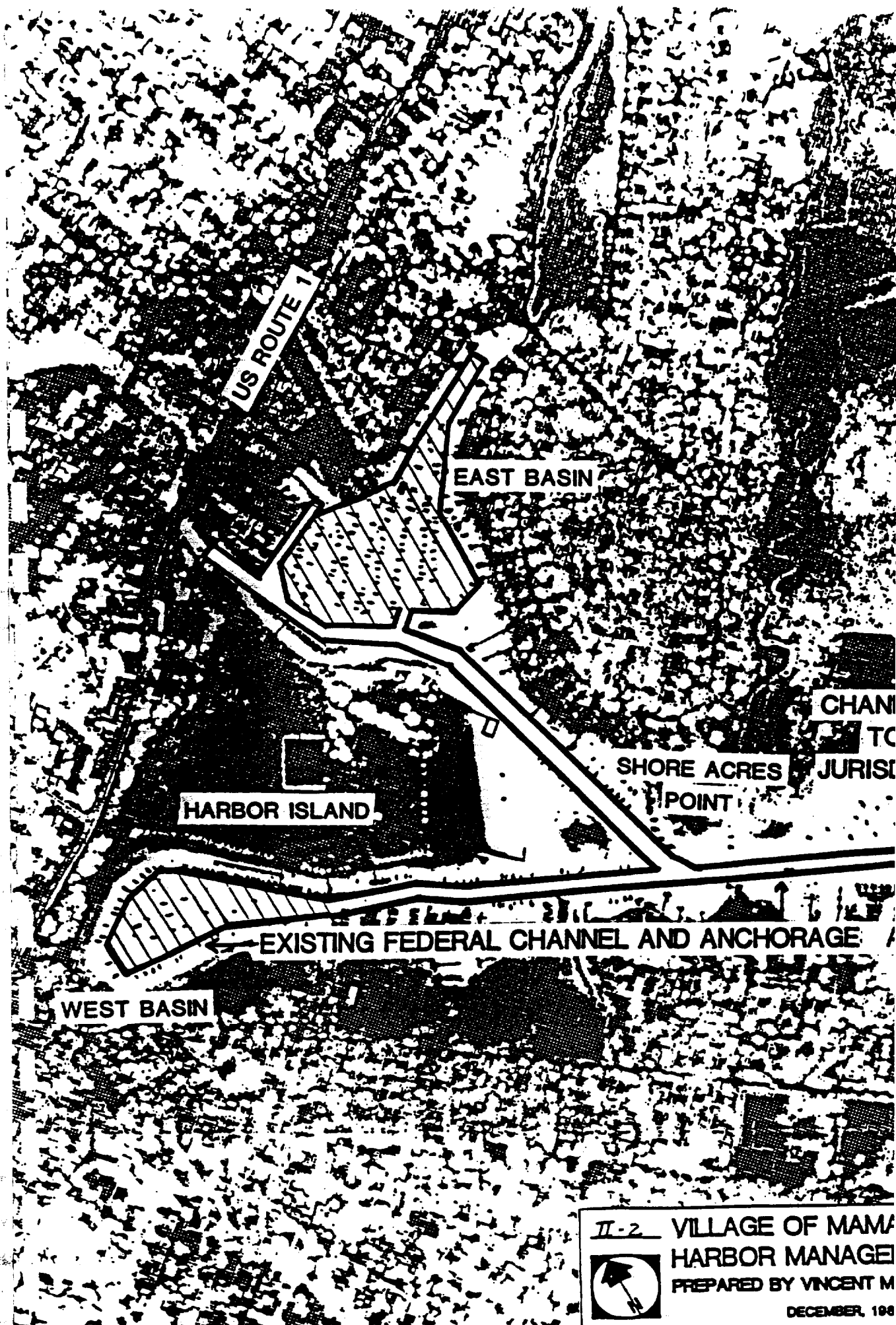
SCALE: 1"=750'

II-1



VILLAGE OF MAMARONECK
HARBOR MANAGEMENT PLAN
PREPARED BY VINCENT M. CANGIANO, P.C.

DECEMBER, 1985



US ROUTE 1

EAST BASIN

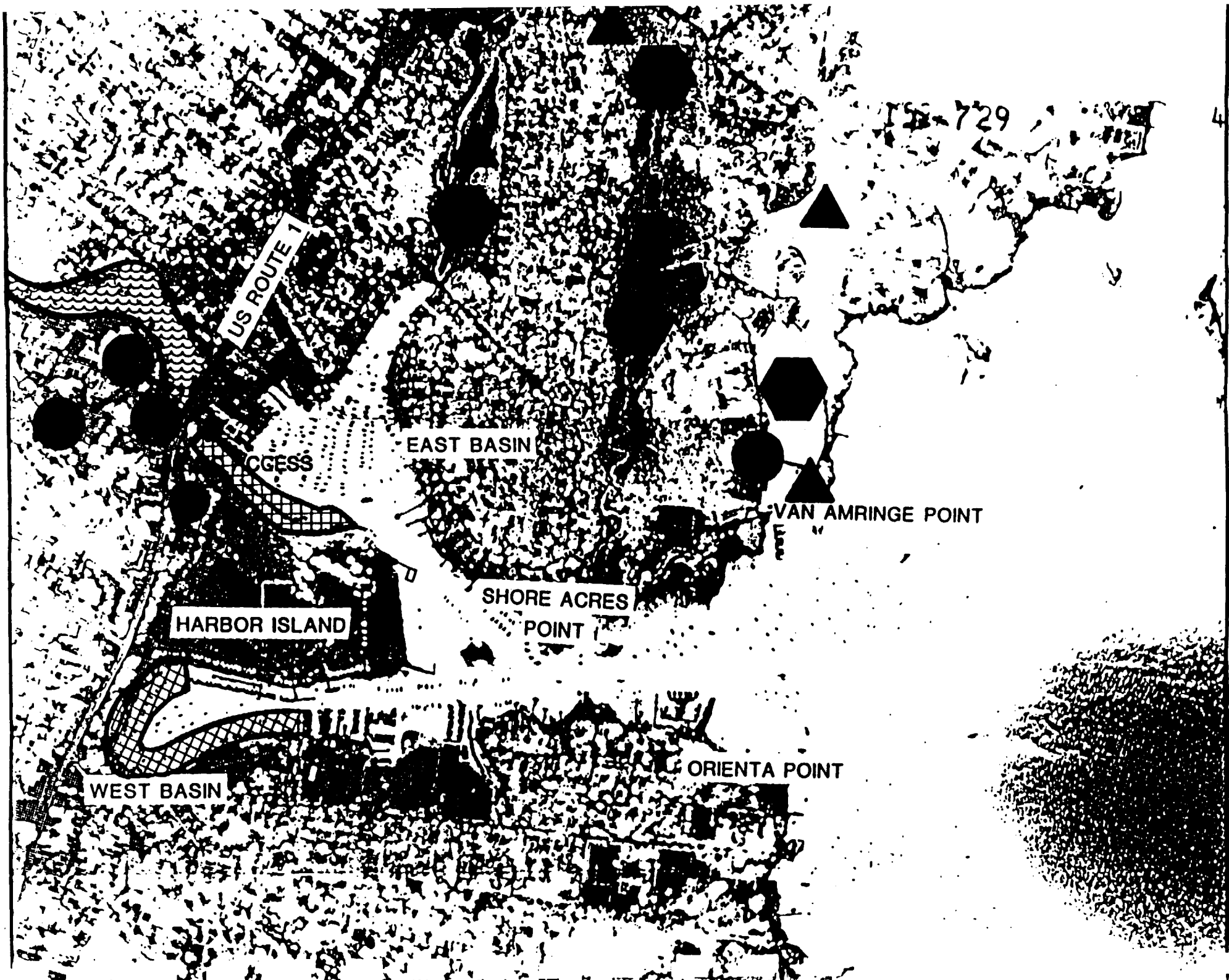
HARBOR ISLAND

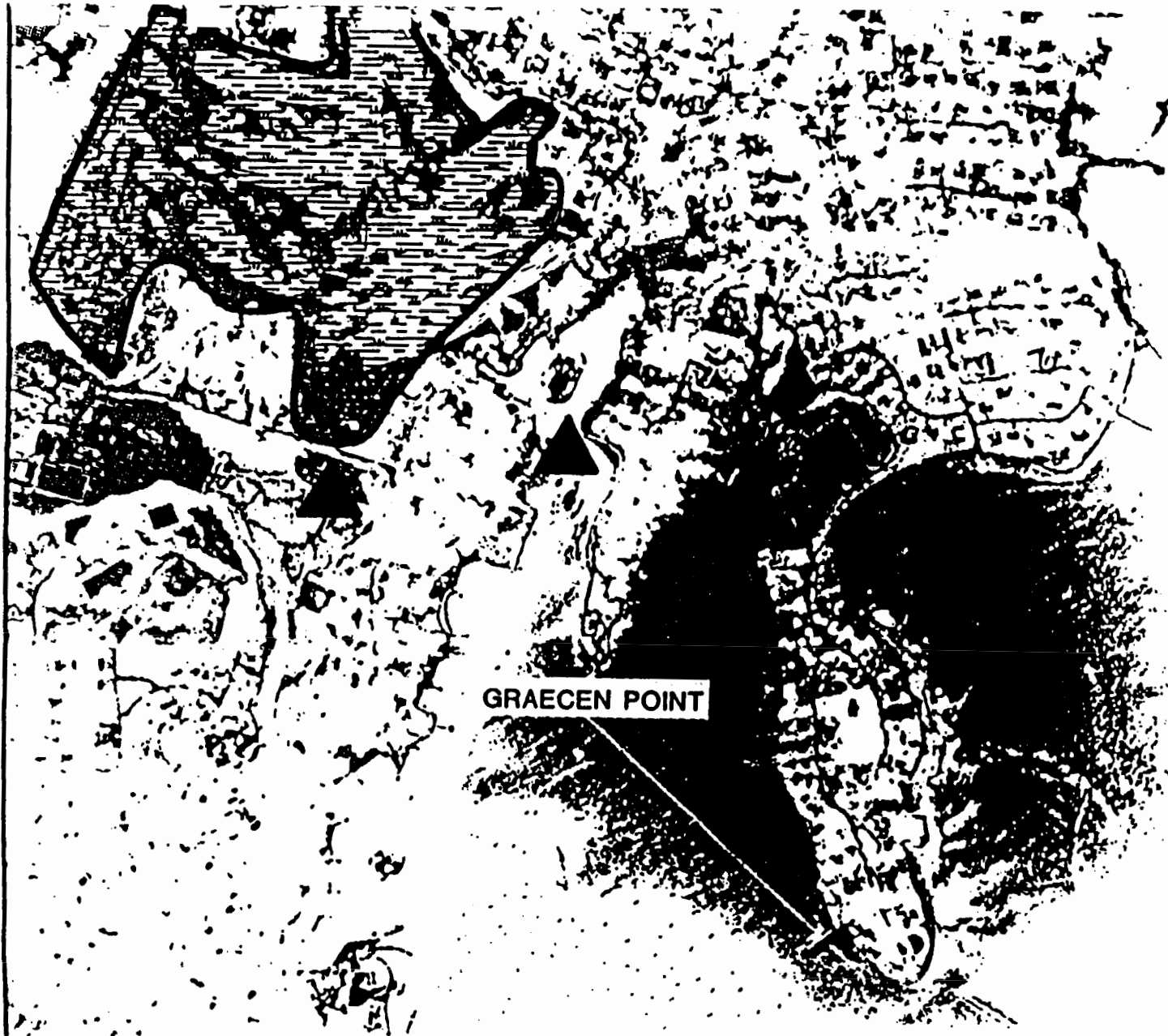
SHORE ACRES
POINT

PROPOSED FEDERAL CHANNEL AND ANCHORAGE AREAS


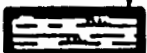



ORIENTA POINT

WEST BASIN





GRAECEN POINT

-  HIGH POTENTIAL DEVELOPABLE AREAS
-  RIVERINE FLOOD HAZARD AREAS
-  PROPOSED CRITICAL ENVIRONMENTAL AREAS
-  CRITICAL ENVIRONMENTAL AREAS
-  SIGNIFICANT FISH & WILDLIFE AREAS
-  MAJOR HISTORIC SITES



area; environmental parameters such as water quality and noise pollution; and socio-economic considerations, including spin-offs from increased boating to businesses.

In order to estimate the capacity of Mamaroneck Harbor, a feasibility study to determine the optimum number of boats was undertaken. The methodology to estimate optimum capacity views the harbor as a series of interconnected links. Viewed as a system, the harbor will have an ultimate capacity that is defined by its most constrained link. As an analogy, the outer harbor, channel and inner harbor may be viewed as a pipeline whose volume of flow is limited to the section of the pipeline with the smallest diameter. System components would include vessel traffic and boat docking space (other capacity components such as water quality and new infrastructure construction have not been included).

To determine capacity, several studies were undertaken, as follows:

- . Using 100' scale mapping and 150' scale aerial photos, developable areas were identified and quantified;
- . A boat inspection of the harbor, existing mooring and dock spaces was undertaken;
- . Important users and regulators of the harbor, including the Harbor Master and members of the Harbor Commission, were interviewed regarding congestion, noise pollution, and other indications of capacity utilization; and
- . New public docking facilities were planned for average size boats (25') for available areas identified in our analyses.

Mamaroneck Harbor, as defined previously, includes all navigable waters, bays and coves within the limits of the Village of Mamaroneck and for a distance of 1,500 feet offshore from the Village boundary, except the waters within the territorial jurisdiction of the City of Rye. To estimate capacity, critical elements of the total harbor were isolated into segments, as follows; the designations which appear below are not intended to alter definitions, but rather only as reference points:

Segment No. 1 - Outer Harbor - From VanAmringe and Orienta Points seaward to 1,500' offshore;

Segment No. 2 - Entrance Channel Area - From outer harbor to intersection of channels to east and west basins at Shore Acres Point;

Segment No. 3 - East Basin - As identified, including area east of the beach; and

Segment No. 4 - West Basin - As identified, including area south of the beach.

SEGMENT NO. 1 - OUTER HARBOR

From observation and discussions, the outer harbor is not a constraint to overall capacity. Utilization is dependent upon the extent of exposure, boat security and access from land. Larger boats are moored in the outer harbor and proposals have been advanced regarding the construction of breakwaters to improve boat accommodations.

The extensive space in the outer harbor could accommodate more boats. Using the size of boat as a determinate and typical docking practices, approximately 56 30' boats per acre could be accommodated on offshore moorings. On the other hand, approximately twenty-four 50' boats per acre is typical and depicts the contrast in boat sizes.

The utilization of the outer harbor can be increased through the provision of a launch service from the inner harbor. It would serve essentially as a taxi service which could also reduce the need for dingys in the inner harbor and, thereby free inner harbor spaces for others on the waiting list. Ideally, the launch service should be partially subsidized to minimize competition and unreasonable rates. Based upon experiences in other boating harbors, the cost for a launch service is itemized as follows: \$35,000 for a 15-20 passenger launch and \$12,000-\$15,000 annually for operation, including an operator, fuel and maintenance. A market of 200 subscribers would be necessary for a break-even operation, assuming \$250 per subscriber, annually.

SEGMENT NO. 2 - ENTRANCE CHANNEL AND ADJACENT AREA (VESSEL TRAFFIC COMPONENT)

The federal channel entering Mamaroneck Harbor is 80 feet wide. There are currently no standards for safe vessel traffic volume from either the Corps of Engineers or the Coast Guard.

Previous Mamaroneck Harbor Boat Traffic Surveys, completed in 1930 (27-hour counts), 1983 (27-hour counts) and 1985 (9-hour counts), indicate that traffic through the channel at Shore Acres Point "peaks" between the hours of 12:00 P.M. and 1:00 P.M. During this peak period, watercraft pass Shore Acres Point at an average rate of 2.43 boats per minute. Visual observations indicate that, with few exceptions, boat traffic runs smoothly at this "peak" rate.

This peak period demand of 2.43 boats per minute, or 146 boats per hour, indicates that approximately seven (7) percent of the 1980 watercraft (including dry sailing) using Mamaroneck Harbor as home port utilize the channel during the peak period. The vast majority of these boats are accommodated in the inner harbor. It is estimated that increases in vessel traffic to the 3 to 4 boats per minute rate would be unsafe and dysfunctional. Therefore, assuming the maximum volume of watercraft that the channel can safely accommodate is three (3) boats per minute, the maximum number of boats that can be accommodated in the inner harbor, following historical boat utilization rates, is approximately 2,600 boats.

SEGMENTS NO. 2, 3 AND 4 - INNER HARBOR (SPACE COMPONENT)

Developable areas within the Mamaroneck Inner Harbor have been estimated using the following formula:

$$DA = TA - FC - AA - D - U$$

Where, DA = Developable areas

TA = Total water surface area

FC = Federal channel dimensions

AA = Federal anchorage areas (limited to moorings)

D = Developed areas

U = Undevelopable (shallow areas, rocks, etc.)

Calculations for harbor capacity are presented below:

INNER HARBOR/ENTRANCE CHANNEL CAPACITY

(Acres)						
<u>SEGMENT</u>	<u>TA</u>	<u>FC*</u>	<u>AA*</u>	<u>D</u>	<u>U</u>	<u>DA</u>
East Basin	58.22	5.71	15.76	12.75	11.63	10.42
West Basin	40.55	3.82	9.18	18.43	4.19	4.93
Entrance Channel	47.82	3.95	0	11.46	12.58	19.83

*Channels and anchorages as proposed by Village and Corps

Developable areas in the Inner Harbor are identified in Figure 5. Minor development or additions to private marinas should still be viewed on a case-by-case basis, as there is some excess capacity within the Inner Harbor/Entrance Channel Segments. The major development proposals estimated here reflect needs of the Village to provide additional accommodations for smaller boats (average 25') and transient boaters.

The south and west shores of the West Basin have been identified as areas suitable for expansion by the Village. A substantial number of berths could be accommodated along this perimeter. Assuming floating docks with two accessways and for boats of approximately 25' in length, it is estimated that an additional 240 boats can be accommodated in this 3-1/2 acre perimeter area. This option of building floating docks would displace approximately 35-40 larger boats now moored on the outer fringe of the West Basin. This proposal could create additional traffic congestion, particularly at the entrance to the West Basin.

Additional floating dock space could also be accommodated near the public dock on the southwest shore of the East Basin. With the proposed change to the alignment of the federal channel and anchorage area in the East Basin, room for expansion for both Village and transient boaters appears to exist. It is estimated that 73 additional slips could be extended on the east end of the public dock and along a parallel floating dock. These proposed docks have been calculated to accommodate forty-seven 25' boats and twenty-six 40' boats. The allowance for the larger boats may also be used to accommodate the large vessels that could be displaced by extending the public dock in the West Basin and by the realignment of the federal channel. Approximately eighteen slips for transient boaters could also be added in this area of the East Basin near the old "sand and gravel" dock. These public facilities would fill approximately five (5) acres or 50% of the available space.

Additions of "star dock" moorings has been investigated for use in the available water area in the southeasternly portion of the East Basin. "Star Docks" provide attractive accommodations for a variety of boat sizes. See Appendix G. A center with spokes allows vessel mooring with surface area for walking. For capacity purposes, a six spoked star dock for 35' boats has been assumed. Approximately twelve 35' boats per acre can be accommodated. An additional 36 boats can be added in this 3 acre parcel.

There appears to be developable areas in the entrance channel to the outer harbor. Limitations to development appear similar to the outer harbor with wind and wave exposure being the most severe. Development should be evaluated on a case by case basis with consideration for encroachment on the federal channel, method of construction and contribution to the ultimate ceiling of boat traffic in the harbor.

In summary, while Mamaroneck Harbor appears highly utilized, there is sufficient space to accommodate new development. Areas in the East and West Basin appear limited to expansions to Village docks and, generally existing moorings are laid out in an efficient manner. Optimum capacity has been estimated, as follows:

- . Vessel Traffic Analysis: 2,600 boats (entire harbor)
- . Space Analysis:

existing	-	1,480
proposed		
floating	-	331
"star dock"	-	24 (36-12 displaced)
		<u>1,755</u> boats (inner harbor)

Expansion in the outer harbor should be encouraged. Members of the Harbor Commission have indicated that the erection of breakwaters would aid in increasing usable area to moor boats in the outer harbor. However, additional constraints, such as the incremental contribution to water pollution by increased boating and the elimination of tidal wetlands by dock construction, should also be considered in estimating the optional development of Mamaroneck Harbor.

III. VILLAGE HARBOR SAFETY AND SECURITY REGULATIONS

A. VILLAGE ORDINANCE - CHAPTER 9: HARBOR AND WATERCRAFT

Chapter 9 of the Village of Mamaroneck Ordinances, Harbor and Watercraft, encompasses the Village navigational laws governing the operation and mooring of watercraft in Mamaroneck Harbor, and specifies the authority of the Harbor Master, under the direction of the Village Manager, with respect to the enforcement of these ordinances. The authority of the Harbor Master mirrors that of the Harbor Commission and encompasses the management of Village public marina facilities, the administration of moorings and the enforcement of watercraft operation regulations.

Watercraft operation regulations prohibit the dangerous operation of watercraft in the Harbor, specifies the speed limit within the posted limits of the harbor, identifies harbor areas where water-skiing, surfboarding and instruction classes are prohibited, prohibits the discharge of sewage, litter and other materials from watercraft, provides for the provision of litter receptacles and toilet facilities at harbor marinas, identifies watercraft facilities required for persons living on their boats and empowers the Harbor Master and Assistant Harbor Master to inspect watercraft and marinas in the harbor to ensure compliance with the State and local navigational laws. Thus, the Harbor Master has the duty to enforce the watercraft operation regulations.

The Village of Mamaroneck Harbor Police (Bay Constable) performs marine patrol duties to ensure and enforce codes, laws and ordinances governing waterways and conservation; does related work as required by the Chief of Police.

Additional equipment to assist the Harbor Patrol would include:

Patrol Boat - It is recommended that a patrol boat/fire boat(s) be provided with adequate trained staff to perform such things as moving vessels in case of fire or emergency, moving of personnel in case of emergency or enforcement of harbor regulations. The patrol/fire boat should be equipped with radio communication links to both the Coast Guard and local police rescue services; fire pumps, handheld fire extinguishers, emergency lighting and flashers and sufficient fuel supply to maintain the boat for extended periods.

Navigation Aids (Speed Control Type) - Sufficient numbers of speed limit markers (moorings) should be added to the existing Coast Guard Nav. Aids to reduce speed/wakes of incurring/outgoing traffic.

B. ROLE OF HARBOR MASTER

Allocation of Mooring Spaces

Under Chapter 9 of the Village of Mamaroneck Ordinances, the Harbor Master has the authority to direct the location of moorings in the Harbor. According to the Harbor Master, moorings are allocated on a first-come, first-serve basis. As inner harbor moorings are more popular than "outer harbor moorings", there is a waiting list for inner harbor moorings. As one becomes available, it is granted to the next applicant on the waiting list. Thus, when members of boat clubs and marinas within the inner harbor relinquish their inner harbor mooring, the right to that mooring does not revert back to that member's boat club or marina. It reverts back to the next applicant on the waiting list.

With respect to the allocation of mooring permits, the Harbor Commission has expressed interest in instituting a Village of Mamaroneck residency requirement. Such a requirement would further the policy of encouraging the utilization of the harbor by Village residents by ensuring

that scarce mooring space be allocated to Village residents. Although Village residents support the harbor with their property taxes, the State of New York holds title to the underwater land in the federal anchorage areas in the harbor. Being federal anchorage areas, the U.S. Army Corps of Engineers determines permissible uses in the area while the U.S. Coast Guard has authority over moorings as well as enforcing U.S. navigational laws. Discussions with the U.S. Army Corps of Engineers and the U.S. Coast Guard indicated that mooring residency requirements were found to be legal in the Town of North Hempstead, New York, on Long Island Sound.

The Town of North Hempstead's residency requirement for the allocation of mooring permits was found to be legal due to the fact that the Town of North Hempstead has the underwater land grant from the State of New York for the underwater land in the federal anchorage areas in their harbor. The Village of Mamaroneck does not hold title to the underwater land in the federal anchorage areas in their harbor, and according to current New York State policy, it is unlikely that such a grant would be given.

IV. PRIVATE DEVELOPMENT IN MAMARONECK HARBOR

A. REGULATORY AUTHORITY OF HARBOR COMMISSION

According to Local Law No. 21-1985, the Harbor Commission has the authority to review building permit applications submitted to the Village Building Inspector for the construction or reconstruction of marine structures, breakwaters, and bulkheads. The ordinance specifies that the Village Building Inspector is to forward the completed permit application to the Harbor Commission within five (5) days of its receipt and the Commission has 31 to 62 days to hold a public hearing and determine, based on five (5) general criteria, whether the application should be approved or denied. If the Commission's decision is to deny the application, the Building Inspector cannot approve it. The applicant may then appeal this decision to the Zoning Board of Appeals. If the Commission fails to act on the application within sixty-two (62) days of receipt of the application from the Building Inspector, the application is automatically denied.

An analysis of the building permit review authority of the various Village commissions has identified that three other commissions could have concurrent jurisdictional review of building permit applications. The first commission with concurrent jurisdiction is the Coastal Zone Management (CZM) Commission. Under Local Law No. 30-1984, the building permit applicant must submit a Coastal Assessment Form (CAF) to the Building Inspector, who forwards it to the CZM Commission. The CZM Commission has the responsibility to review all "Type I" actions, i.e. actions likely to require an environmental impact statement and "unlisted" actions to determine if the action is consistent with the policies of the Local Waterfront Revitalization Program. The CZM Commission then has thirty (30) days from the receipt of the application to file a Certificate of Determination with the Village Clerk. This Certificate of Determination will identify whether the proposed action will or will not substantially hinder the achievement of any Local Waterfront Revitalization Policies. Although the CZM Commission also reviews Type II actions, i.e. actions which are not expected to have a significant impact upon the environment, the Harbor Commission will also have the responsibility to submit a Certificate of Determination when reviewing building permit applications for Type II actions - the reconstruction of existing marine structures, breakwaters or bulkheads. Thus, the Harbor Commission and the CZM Commission will have joint jurisdiction over the review of Type I and unlisted actions in Mamaroneck Harbor.

In addition to the Coastal Zone Management (CZM) Commission, the Village Planning Board also has the power to review building permit applications. According to Local Law No. 19-1985, the Village Planning Board has to give site development plan approval for "... the erection, enlargement or change of use of any building or structure other than one or two family dwellings..." in all districts prior to the issuance of any building permit by the building inspector. Discussions with the Chairman of the Planning Board indicated that although the language of the ordinance gives the Planning Board the power to review building permit applications for the construction or reconstruction of marine structures, breakwaters or bulkheads, it is unlikely they would exercise this power except if these structures were a component of a landside development proposal. The Planning Board's main interest is reviewing "landside" proposals. Thus, although Local Law No. 19-1985 gives the Planning Board jurisdiction over building permit applications that the Harbor Commission has jurisdiction to review, joint review would occur only in instances of development proposals which included both land and waterside construction/reconstruction activities.

Finally, according to Local Law No. 12-1977, the Board of Architectural Review, Section 5(a) has the authority to review "... every application for a permit for the construction or reconstruction of any building or structure...for all commercial and retail use within the legal confines of the Village of Mamaroneck...". This ordinance gives the Board of Architectural Review the power to review building permit applications for commercial marine structures that are also being reviewed by the Harbor Commission.

Thus, an analysis of Village of Mamaroneck local ordinances has identified four (4) local commissions which have the authority to review building permit applications for the construction or reconstruction of marine structures, breakwaters and bulkheads - the Harbor Commission, the Coastal Zone Management Commission, the Planning Board and the Board of Architectural Review.

The initial inspection of these local laws gives one the impression that building permit review procedures in the Village of Mamaroneck are complicated procedures which would take a minimum of 67 days. In reality, building permit applications for the simple construction or reconstruction of a marine structure, breakwater or bulkhead would involve the review by the Harbor Commission, the Coastal Zone Management Commission and the Board of Architectural Review. Coordination between the Harbor Commission and the CZM Commission occurs as a Harbor Commissioner is an ex-officio member of the CZM Commission. However, neither commission has a structured mechanism to coordinate their activities

with the Board of Architectural Review. This lack of coordination becomes critical when more complex development proposals requiring the involvement of the Planning Board are being reviewed.

The Planning Board's site review process is an evolutionary process in which development proposals are negotiated to best meet the needs of the Village as well as those of the building permit applicants. With the exception of the CZM Commission, which has an ex-officio member of the Planning Board on its commission, there is no mechanism to inform the other commissions of the current components of the building permit application. This lack of coordination could result in uninformed and undesirable decisions by the Commissions or lengthen the review process considerably. To prevent this waste of Commission resources and to streamline the review procedure, the following coordination mechanisms are proposed for consideration:

1. Hire a Village Planner/Engineer

The function of this Village staff member would be twofold:

- (a) Coordinate the building permit application review procedure, ensuring that the appropriate building permit applications are forwarded to the appropriate commission or board in a timely manner, and that each commission or board is informed of the status of the other's review.
- (b) Provide each commission or board with necessary technical information to assist these commission or boards with their reviews. The cost of this staff member, which is estimated to be \$51,000, including fringes, could be defrayed by review fees.

2. Ex-Officio Commission Members

To keep the various commissions informed of other commission activities and decisions, ex-officio commission members such as those on the CZM Commission might serve as a coordination mechanism. The success of this mechanism is a function of the volunteer commission members' willingness to devote additional time to this goal.

3. Joint Review Meetings

To facilitate the review process in more complex development proposals which involve site plan review by the Planning Board, it is recommended that joint commission

meetings be held to streamline the review process and to keep all committees abreast of the proposed development.

In conclusion, a review of current building permit review procedures indicates changes are warranted to facilitate the process. A planner/engineer Village staff member could serve not only as a coordinating mechanism for the commissions, but also provide technical assistance to the committees in their review of the applications according to their mandated criteria. The estimated cost to the Village would be approximately \$51,000, of which \$20,000 has already been budgeted to provide technical assistance to the Planning Board on a consultant basis.

Besides a coordinating staff member, the use of such coordinating techniques as ex-officio members and joint review meetings, would contribute to a streamlined, coordinated review process.

B. PROCEDURES FOR REGULATION OF PRIVATE DEVELOPMENT/DREDGING IN MAMARONECK HARBOR

As regulator of private development and dredging activities in Mamaroneck Harbor, the Harbor Commission performs review activities similar to those performed by a planning board in their site plan review activity rather than those of a zoning board. A zoning board indicates what uses are permissible in a particular area. As long as a developer proposes a use that is permitted by the zoning board as embodied in their zoning map, the developer has the right to proceed with the proposed action. On the other hand, the Planning Board has the opportunity to review the proposed action and to attempt to negotiate a development plan that best meets the needs of their town or village. As the Harbor Commission is to review building permit applications for proposed development activities in the Harbor, their functions reflect those of the Planning Board. Indeed, this power of review provides the Harbor Commission greater control over the direction of development in the Harbor than would a static water use zoning map.

To exercise this power of review properly, the Harbor Commission must receive adequate information from building permit applicants. Adequate information would enable the Commission to determine in a timely manner whether the proposed action meets their review criteria and what changes would be necessary to improve the proposed action. Adequate information would enable the Harbor Commission to negotiate with the applicant the most appropriate marine structure, breakwater or bulkhead for Mamaroneck Harbor.

1. Information to be Submitted to the Harbor Commission

To determine what constitutes adequate information, the U.S. Army Corps of Engineers permit application procedure, the NYS Department of Environmental Conservation permit procedure, the Coastal Zone Management Consistency Assessment Form and the recently adopted Village of Mamaroneck site plan review procedure (Local Law No. 19-1985) were reviewed. It is recommended that these documents serve to identify the necessary information to be submitted to the Harbor Commission, eliminating duplication of effort on the part of the applicant. Furthermore, these federal and state applications are structured so as to facilitate the review of the proposed action by the Harbor Commission and to alert the Commission of any potential navigational and environmental impacts.

(a) U.S. Army Corps of Engineers

In general, the Army Corps of Engineers requires the following information to be submitted:

- . A detailed description of the proposed activity, including the purpose, use, type of structures, types of vessels that will use the facility, facilities for handling wastes and the type, composition and quantity of dredged or fill material.
- . Names and addresses of adjoining property owners and others, on the opposite side of streams or lakes or whose property fronts on a cove, who may have a direct interest because they could possibly be affected by the project.
- . Complete information about the location, including street number, tax assessors description, political jurisdiction and name of waterway in enough detail so that the site can be easily located during a field visit.
- . A list of the status of all approvals and certifications required by other federal, state, and local governmental agencies. This information is important because review time is often reduced by joint or simultaneous processing.
- . Reasons that explain denial of any approvals or certifications required by other government agencies. When other approvals or authorizations are denied, application for a Corps permit may not be approved.

Specific Corps of Engineer Information is included in Appendix F.

- (b) New York State Department of State Coastal Management Program - Federal Consistency Assessment Form (CAF). In addition to a description of the proposed activity, the coastal assessment of the following issues must be completed:

COASTAL ASSESSMENT - Check either "Yes" or "No" for each of the following questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

	<u>Yes</u>	<u>No</u>
1. Will the proposed activity <u>result</u> in any of the following:		
a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)	___	___
b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44) ..	___	___
c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)	___	___
d. Reduction of existing or potential public access to or along coastal waters? (19, 20)	___	___
e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9, 10)	___	___
f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)	___	___
g. Siting of a facility essential to the generation or transmission of energy? (27)	___	___
h. Mining, excavation, or dredging activities, or the placement of dredged or fill materials in coastal waters? (15, 35)	___	___
i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (15, 35)	___	___

- j. Draining of stormwater runoff or sewer overflows into coastal waters? (33) — —
- k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39) — —
- l. Adverse effect upon land or water uses within the State's small harbors? (4) — —
- 2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:
 - a. State designated freshwater or tidal wetland? (44) — —
 - b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17) — —
 - c. State designated significant fish and/or wildlife habitat? (7) — —
 - d. State designated significant scenic resource or area? (24) — —
 - e. State designated important agricultural lands? (26) — —
 - f. Beach, dune or barrier island? (12) — —
 - g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3) — —
 - h. State, county, or local park? (19, 20) — —
 - i. Historic resource listed on the National or State Register of Historic Places? (23) — —
- 3. Will the proposed activity require any of the following:
 - a. Waterfront site? (2, 21, 22) — —
 - b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5) — —
 - c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16) — —
 - d. State water quality permit or certification? (30, 38, 40) — —
 - e. State air quality permit or certification? (41, 43) — —

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document*) — —

(c) New York State Department of Environmental Conservation

Chapter 9, Section 25 of the Village of Mamaroneck Local Ordinances, states:

"By virtue of the Navigation Law and the Conservation Law, it is unlawful to place, maintain, erect, reconstruct or repair, in the navigable waters of the State, any wharf, dock, pier, jetty, or other type of structure without first obtaining a permit therefor from the Conservation Department. The permit is applicable to any such facility which extends more than forty (40) feet from the shore or extends into water four (4) feet or more deep, as measured at the ordinary low stage of such water."

It is recommended that this NYS DEC permit application (included in Appendix F) constitute a portion of the information to be submitted to the Harbor Commission.

(d) Village of Mamaroneck Site Plan Review Ordinance

When the proposed action is part of a landside development proposal, the Village of Mamaroneck Site Plan Review Ordinance would designate the appropriate information to be submitted in addition to the three (3) previously identified application forms.

The Harbor Commission should have readily available with the building inspector a package containing the identified application forms. These forms should be submitted at least fifteen (15) days in advance of the Harbor Commission meeting at which the permit application is to be considered. All maps of the specific project submitted must be at a scale of not less than thirty (30) feet to the inch, while the project location map should be at a scale of two hundred (200) feet to the inch so that the proposed action may be placed into the context of the water use map.

2. Building Application Review Criteria

Once the appropriate information is submitted to the Harbor Commission, the Commission can begin its review of the proposed action with respect to federal, state and local criteria:

(a) Local Review Criteria

1. Method and manner of construction (engineering standards are included in Appendix G).

The large number of site specific variables make it difficult to specify exacting methods/manner of construction. Particulars such as ownership of the facility, exposure (offshore or harbor protected), and subsurface soil conditions will alter the type and cost of construction (see Attachment (a)1).

An assortment of design specifications and guidelines have been reviewed. Several national organizations, such as the American Society of Civil Engineers, the Army Corps of Engineers, and State/local organizations, publish design standards for marinas and small boating facilities. Of those published, the following list is considered to be the most comprehensive, understandable, and suitable for use by the Harbor Commission in reviewing developer proposals.

- Layout and Design Guidelines for Small Craft Berthing Facilities, State of California, 1984.
- National Fire Protection Association "NFPA 303", 1984.
- National Electrical Code "Marinas & Boatyards Article 555", 1984.
- Mooring standards and specifications as listed in Appendix G.

Other recommended marine design standards include:

- Army Corps of Engineers "Shore Protection Manual Volume I and II", 1984.

- "Ice Engineering for the design of Small Craft Harbors and Structures" by C. Allen Woztley, University of Wisconsin, Sec. Grant Institute, 1984.
- Small Craft Harbors, Design Construction and Operation Special Report No. 2, Army Corps of Engineers.

A licensed engineer, familiar with marine construction, should assist the Harbor Commission in the review of developer applications and the utilization of the recommended construction guidelines. It may also be prudent to distribute copies of these recommended guidelines to developers in advance. Additionally, the applicability of these guidelines to specific proposals, locations and circumstances should be on a case-by-case basis as determined by the Harbor Commission. This approach would provide some flexibility for developers while also providing the Harbor Commission with the means to maintain and improve the quality of construction in the harbor.

2. Inappropriateness of marine structure/bulkhead/breakwater (standards are included in Appendix G).
3. Conflict with Harbor Management Plan as embodied in the Water Use Map and the Harbor Management Policies. The Harbor Management Policies were developed by the Harbor Commission and are presented in PART ONE of this report.

The Water Use Map identifies the federal channel, federal anchorage areas, federal pier and bulkhead lines, tidal wetland areas, shellfish concentration areas, swimming areas, transient anchorage areas, public access areas and critical environmental areas. The proposed action should be overlaid on the Water Use Map to identify any potential conflicts of the proposed action with the water use plan.

4. Navigation Hazard - Does the proposed action interfere with the existing channel or fairways? Would it inhibit the movement of watercraft in the Harbor?

5. Environmental Consequences - Completion of the NYS Coastal Zone Management Consistency Assessment Form and the NYS Department of Environmental Conservation Permit Application by the applicant will alert the Harbor Commission of potential adverse environmental impacts of the proposed action.

(b) New York State Review Criteria

- . Has the applicant completed and submitted the NYS Department of Environmental Conservation Permit Application as required by Chapter 9, Section 25 of the Village Ordinance?

- . Does the applicant possess the land grant from the New York State Bureau of Land Utilization?*

*Discussions with the NYS Office of General Services, Bureau of Land Utilization identified that the State is currently updating the "land grant" map for the County of Westchester. The map of land grants available at present is outdated. Yet, the information on these maps has been compiled on an overlay for the information of the Harbor Commission.

Also discussions with the Bureau of Land Utilization indicated the following with respect to the issues of land grants and riparian rights.

1. The NYS Public Lands Law does not mandate the upland property owner to receive a grant, lease or easement from NYS prior to using the under water property. However, nothing in the law gives the upland property owner permission to utilize the underwater land without NYS permission. In fact, to receive financing, the upland property owner must show title to the underwater land. (McKinneys Consolidated Law Book #45, Public Land Law, Article 2, Section 3, Easements and Titles, and Article 6, Section 75.)
2. The NYS Department of Environmental Conservation interprets this as follows:
 - a. Substantial Improvement: NYS land grant, lease or easement from Bureau of Land Utilization required.
 - b. Seasonal Removable Structures: NYS land grant, lease or easement not required.

In addition to the issue of land grants, the Bureau of Land Utilization indicated that the issue of riparian rights be addressed in the Harbor Management Plan: Any property owner wishing to construct a marine structure, breakwater or bulkhead, should not impinge on his neighbors' waterfront to access/egress his facility. For example, a person would not be permitted to construct a house and garage on his property in such a manner as to require him to use his neighbor's property to get his car into/out of his garage. Similarly, a person should not be permitted to construct a dock in such a manner as to require him to use his neighbor's waterfront to access his dock for this would be an infringement on his neighbor's riparian rights.

(c) Federal Review Criteria

- . If necessary, has the applicant submitted the appropriate U.S. Army Corps of Engineers permit? (The proposed action extends into the federal channel, anchorage areas or beyond the pier and bulkhead lines).

Once the permit application has been reviewed according to these criteria, the Harbor Commission can make a determination as to whether the application should be approved or denied.

V. PUBLIC MARINE FACILITIES IN MAMARONECK HARBOR

The public marina in the Village of Mamaroneck is a scarce resource. Of twenty-five (25) Long Island Sound coastal towns telephoned in a survey of coastal Towns, eleven (11) or (44%) have public marinas. The public marina is the particular vehicle to realize the goal to encourage or facilitate the use of the Harbor by Village residents. At present, while forty-four percent (44%) of the watercraft docked or moored in Mamaroneck Harbor are non-residents, only 8% of these docked at all of the Village floats are non-residents. Furthermore, the existence of the Village floats facilitates the use of the Harbor by small boat owners. The average size of watercraft docked or moored in Mamaroneck Harbor during the 1985 season was 22 feet, while the average size of watercraft docked at the Village floats was fifteen (15) feet.

A review of the issues identified in the Harbor User's Survey indicates persons believe that Village float slips are allocated on the basis of political connections and favoritism with users citing that some families have two slips while others remain on the waiting list. A review of the dock permits indicates that only 15 (8%) households have more than one dock permit.

A. HARBOR MASTER AS MANAGER OF PUBLIC MARINA

In the Village of Mamaroneck, the Harbor Master, in addition to his duty as 'enforcer' of the Village navigational laws, has the responsibility to manage the Village marine facilities. This role of the Harbor Master is unusual as the survey of coastal towns identified that 87.5% of the coastal towns with public marine facilities hired "dock masters" to manage these facilities, which are under the auspices of the local Parks and Recreation Departments. Yet, as manager of the Village marine facilities, the Harbor Master allocates docking space and determines the adequacy of current facilities preparing the budget for the operation, maintenance and capital improvements of the public facilities.

B. EXISTING PUBLIC MARINE FACILITIES

The Village of Mamaroneck controls the following waterfront facilities.

West Basin: Approx. 290 floating dock slips, moorings, 1,400 sq. ft. of building space operated by the harbor master. 400 sq. ft. of building occupied by the Coast Guard Auxillary.

East Basin: Approx. 142 floating dock slip, moorings, boat launch ramp, and 75 l.f. of dock (sand & Gravel Pier).

Other Items/facilities include: 750 l.f. of beach, and 300 l.f. of floating docks at misc. locations within the harbor proper.

1. Adequacy of Existing Facilities

There are approximately 140 boats presently in the Village's waiting list for slips and moorings. The number of boats in the waiting list varies yearly, but there is always a shortage of public dock and mooring spaces.

C. ADDITIONAL PUBLIC MARINE FACILITIES

Interviews with various persons within the Harbor Community and inspection of the Harbor facilities revealed the need for the following list of new or improved facilities.

1. Launching Ramp Repairs - The present launching ramp becomes unusable at low tide due to deterioration of the ramps below foundations. Repairs would include cleaning of the ramps concrete bed and replacement and extension of the concrete bed below water.
2. Wastewater Pumpout Facility - In order to enforce the present Village regulations restricting the use of marine toilets, a public accessible pump out station should be provided at the Village Facility. The pump out station should be located on one of the Village's floating docks at a location that can be monitored at all times.
3. Water Service - Because of the limited water service, lack of adequate fire protection at Harbor Island, a new 8-inch water line should be included with any harbor improvement request. An adequate fire protection system to include onshore hydrants is recommended in the National Fire Protection Associations Standard 303, 1984.
4. Seawall Repairs - The stone masonry seawall which encompasses the majority of the West Basin and the southern portion of the East Basin is in need of repair. Vandalism, neglect and age has resulted in the need for repairs. Neglect of repairs will result in loss of material from behind the wall and the attrition of material into the waterway.
5. Transient Boat Slips - Available accommodations for transient boaters has fallen short of the need within Mamaroneck Harbor. Discussions with the Harbor Commission suggests two locations which might be acceptable. The expansion of the West Basin via dredging and switching the method of securing boats from moorings to

adding blocks of floating docks and on utilization of the Village Dock (Sand & Gravel). Expansion of the West Basin is discussed in Chapter II. Rehabilitation of the Village Dock could be accomplished by adding floating docks outboard of the existing facility with minimal work to existing dock structure.

Based on the limits of the existing Federal Channel and Pier and Bulkhead Lines, approximately 570 linear feet of floating docks could provide 18 premium slips for boats averaging 25 feet in length. Cost for this alternative would be approximately \$40,000 using a float dock cost of \$12.00 per square foot and \$5,500 for a limited rehabilitation of the existing dock structure.

6. Additional Access In and Out of Harbor Island - The Harbor Commission discussed the possibility of providing additional Entrance and Egress to Harbor Island. The idea provides an additional roadway from the West Basin Parking Lot along the shore line of the West Basin and intersect with Route 1. While this proposal would lessen the traffic flow problems within the Harbor Island, it would reduce the amount of green area within the park and possibly increase the number of nonpark user vehicles crossing the "strip". Addition of this type of roadway would require sanctions from NYDOT to include traffic studies to determine the new roadways effect on Route 1 traffic.
7. Dredging Maintenance Needs - The Mamaroneck Harbor has continuing needs for maintenance dredging. The Mamaroneck River and two creeks entering into the Harbor cause continual siltation limiting navigational access and impairing boating safety. Maintenance dredging is particularly critical in the East and West Basin of the Harbor.

Traditionally, the U.S. Army Corps of Engineers has maintained the federally authorized channel and anchorages areas in Mamaroneck Harbor. According to records, the Army Corps' most recent dredging in Mamaroneck Harbor occurred in 1981-1982 (20,187 cubic yards), which represented the first maintenance dredging in approximately fifteen years. It appears likely that the federal channel and anchorage areas will be re-aligned to comply with recommendations from the Village. It will remain critical to the economy of the Village to have the Corps maintain these federally authorized areas.

To determine maintenance dredging needs for the Harbor, historical records of the New York District of the Corps were reviewed. The determination of dredging needs employed an "average yearly shoaling rate" based upon analysis of these historical records. This average yearly shoaling rate was then applied to channels, anchorages and harbor areas (square feet) for approximately 8 feet of water. More detailed inventory techniques would require hydrographic, oceanographic and riverine siltation surveys.

Projects annual maintenance dredging needs for Mamaroneck Harbor are listed below:

Annual Maintenance Dredging

<u>Sponsor</u>	<u>Cubic Yards/Year</u>
Federal	5,100
Municipal	5,200
Private	<u>5,200</u>
Total	15,300

Source: "Feasibility Study of a Cooperative Harbor Maintenance Program for Westchester Long Island Sound Communities", CE Maguire, Inc., May 1983.

These dredging maintenance volumes do not consider new construction and can probably be considered minimum amounts. Any new marina projects or depths beyond eight feet would exceed these estimated volumes.

Plan for Maintenance Dredging

In the summer of 1982, maintenance dredging by a variety of sponsors was coordinated with resulting cost savings. Disposal of dredged material will always be critical to the survival of Mamaroneck Harbor. Open water disposal at WLIS-III (Norwalk, Connecticut) is currently the only viable option for the maintenance dredging of the Harbor. Both coordinated dredging activities and strong support for maintaining a disposal site in western Long Island Sound are important leadership roles for the Harbor Commission.

Typical ranges of costs for dredging in Mamaroneck are listed below:

<u>Dredging Activity</u>	<u>Cost Estimate</u>
Mobilization	\$40,000 to \$60,000
Dredging	
Open Water Disposal	
WLIS III	\$ 5 to 7/CY
CLIS (New Haven)	\$10 to 17/CY
NY Mud Dump	\$10 to 17/CY
Upland Disposal	\$12 to 20/CY
Testing: LIS	\$50,000-\$70,000/Permit App.
Open Ocean	\$75,000-\$80,000/Permit App.
Upland	\$10,000/Permit App.

Engineering Supervision 15% of Project Dredging Cost

Coordination of dredging projects and the important availability of WLIS-III are clearly depicted in this cost data.

For planning purposes, Mamaroneck Harbor should be dredged every five years. Assuming coordinated dredging and disposal at WLIS-III, the projected annual cost for maintenance dredging for areas under Village sponsorship would be approximately \$63,400. Considering the magnitude of these annual costs, the importance of maintenance dredging to the viability of the entire harbor, and the economic/recreational significance of harbor activities to the Village, the Harbor Commission should seek a special harbor maintenance fund for dredging expenses.

Currently, Village dredging expenses are paid through allocations from the Village general fund. Annual revenues from the issuance of mooring permits is approximately \$23,400. It is evident that continued support for maintenance dredging by the Village will be required in the years ahead.

Highlights of a dredging program for the Harbor are summarized below:

- . Maintenance dredging should be done every five years;
- . Coordination of private, municipal and federal dredging should be undertaken to reduce costs of hiring dredging contractors and obtaining permits;

- . The continued availability of an open water disposal site in western Long Island Sound is critical;
- . Annual cost of maintenance dredging are approximately \$63,400 (1985); and
- . The Harbor Commission should take a lead role in dredging coordination and in communicating the importance of this vital activity to the viability of the Harbor.

D. COST OF ADDITIONAL MARINE FACILITIES AND HARBOR IMPROVEMENTS

Budget cost estimates for the above list of items is as follows:

. Launch Ramp - Rehabilitation and Extension of the Existing Facility	\$ 6,500
. Wastewater Pump - Fix pump fixture to existing floating dock with new piping and tie to existing sewer at Harbor Master Building.	45,000
. New 8" Water Service - Water line from Route 1 to Harbor Master Building, including 2-Fire Hydrants.	65,000
. Seawall Repairs - Repairs to approx. 500 l.f. of stone masonry seawall.	30,000
. New Entrance/Egress Roadway - from West Basin Marina parking area to Route 1.	73,000
. Transient docking area	40,000
. Expanded public docks (West Basin)	287,000

E. ALLOCATION OF DOCK SPACE AT THE PUBLIC MARINA

According to Chapter 9, Harbor and Watercraft of the Village of Mamaroneck Local Ordinance, Village Boat Float permit applications can be requested in writing to the Village Manager. Priority is given in the issuance of permits to those persons applying for the renewal of permits granted in the previous year. After February 15, the last date for filing applications for renewal of permits, applications for new permits will be forwarded to those persons who have requested a permit as space is available for the type and size of vessel for which float space has been requested. At present, four hundred thirty-seven (437) boats are accommodated at the public floats. According to the Harbor Master, there is a waiting list of approximately 140 persons. The fee schedule for the public docks is as presented below. The average fee is \$270 per season in contrast to the average private fee being almost \$1,400 per season.

Village of Mamaroneck
Float Fee Schedule

Non-residents add \$200.00 to the applicable float fee.

Up to 12' (Dinghys with narrow beam, 5' or less)	\$100.00
12'1" to 16' (Beam of 5' to 7')	12.00/ft
16'1" to 22' (Beam of 8')	15.00/ft
22'1" to 25' (Special Float w/fingers, renewals only)	20.00/ft
Senior Citizen Discount (65 years or older w/minimum of three years on float at regular fee)	20%

*The above rates include a parking decal.

VI. CONCLUSION AND SUMMARY

The goal of the Harbor Management Plan is to provide the Harbor Commission with the necessary information and guidelines so that they might fulfill their roles and responsibilities as Advisor on matters of Harbor Safety and Security, as Regulator of Private Development in the Harbor, and as Overseer of the Village docking and launching facilities.

A. HARBOR POLICIES

The Harbor Policies have been developed by the Harbor Commission. The recommended harbor policies and possible implementation techniques are included in Part One of this report.

B. IMPLEMENTATION OF THE HARBOR MANAGEMENT PLAN

The implementation of the Village of Mamaroneck Harbor Management Plan will be realized through the amendment of existing Village ordinances and through the adoption by the Village Board of Trustees of a budget for the operation, maintenance and capital improvements to Harbor facilities.

1. Budget Considerations

In addition to the existing operating and maintenance costs, the following items are recommended to be included in the annual Village budget:

Dredging Fund	\$ 63,400
Engineer/Planner (Commission Assistant) ²	51,000
Expanded Harbor Patrol ¹	<u>38,790</u>
Total	\$153,190

The following capital improvements are also recommended:

Expansion of Public Marina (West Basin)	\$287,000
Launching Ramp Improvements	6,500
Wastewater Pump	45,000
Water Service Line	65,000
Seawall Repairs	30,000
Harbor Island Roadway	73,000
Transient Docking Facilities (18 slips)	<u>40,000</u>
Total	\$546,500

¹Two Bay Constables - Two tours of duty per day.

²Support would be provided to four commissions: Harbor Commission, CZM, Board of Architectural Review and Planning Board. A total of \$20,000 for technical assistance has been included in the budget of the Planning Board. A \$35,000 salary plus 45% fringe package is assumed.

2. Amendments to Village Ordinances

To facilitate the implementation of the Harbor Management Plan, the Harbor Commission has developed and approved a number of policies and implementation steps to be adopted by the Village Board of Trustees. These proposed policies and implementation steps are presented in Part One of this report.

In addition to these policies, the following are offered for consideration by the Board of Trustees to facilitate the implementation of the Harbor Management Plan

- (a) Provide for the presence of ex-officio members on Village Commissions with concurrent jurisdictions.
- (b) Provide for the conduction of joint meetings of Commissions with concurrent jurisdictions.
- (c) Adopt the Water Use Map as the embodiment of the Harbor Management Plan, providing the Harbor Commission with review criteria.
- (d) Identify the following documents as sufficient information to be submitted by building permit applicants desiring to construct/reconstruct a marine structure, breakwater or bulkhead:
 - (1) U.S. Army Corps of Engineers Permit Application, including a site location map of 200-foot scale.
 - (2) NYS Department of Environmental Conservation Permit Application.
 - (3) NYS Office of General Service - Land Grant Title.
 - (4) Site Plan Review Information if building permit application includes a "landside" development proposal.
 - (5) A map of the proposed project of not less than 30-foot scale, identifying the project, the federal channel lines, the federal pier and bulkhead lines and federal anchorage area if in the vicinity.

(Copies of these documents are included in Appendix F.)
- (e) Provide that Village residents have priority in the allocation of slips at the Village marina; (the legality of a similar requirement for moorings is questionable).

APPENDIX A
HARBOR USER SURVEY

A total of 2,724 surveys were mailed to all households which had secured a marina mooring/public dock permit or a Village beach permit during the summer 1985 season. A total of 611 persons (22.4%) responded.

1. Plan for future of Harbor?

Yes - 605 (98%) No - 6 (1%) No response - 5 (1%)

2. Boat usage during the season?

Daily - 166 (27%) Every Other Weekend - 49 (8%)

Every Weekend - 323 (53%) 1 Weekend a Month - 5 (1%)

No Response - 59 (10%) Other - 5 (1%)

3. Boat storage during the season

General

Inner Harbor - 304 (50%)

Outer Harbor - 72 (12%)

Dry Sailed - 6 (1%)

No Response - 229 (37%)

Specific

Commercial Marina - 99 (16%)

Private Dock - 28 (5%)

Club - 104 (17%)

Village Floats - 176 (29%)

No Response - 197 (33%)

Offshore Mooring

Inner Harbor - 115 (19%)

Outer Harbor - 61 (10%)

No Response - 435 (71%)

4. Allocation of Dock Space

Current - 242 (40%) Village Residents 1st - 260 (43%)

1st come 1st serve - 49 (8%) Lottery - 7 (1%)

No Response - 53 (8%)

5. Effect of Boating Activities on the Beach

Favorable - 255 (42%)
Unfavorable - 43 (7%)
No Opinion - 313 (51%)

Major Concerns on Question #6

6. Do you have any other concerns which should be addressed in the Harbor Management Plan?

- . POLLUTION (#1, = 75% + mentioned this)
- . Village residents should have slip priority because they pay the high taxes.
- . Safe boat operation
 - Motorboat and raceboat noise, speed and wake
 - Reckless operation
 - Boats don't use lights at night
- . Improvements
 - Lighting electricity and fresh water should be provided on ramps and/or floats
 - Public dock for guest use
 - Provide restaurant or snackbar
 - More floats (also for larger boats)
 - More slips (also for larger boats)
 - More boats should be allowed at station
 - More winter storage space
 - Improve parking for East Basin boat owners
 - Floats overcrowded
 - Water taxi to and from dock - investigate idea
 - No new structures needed
- . Maintenance
 - Better maintenance and cleanup
 - Repair basin walls and seawalls

- Improvements to field.
- . Security
 - Gates need working lock
 - Gate-watchers should be provided
 - Docks and floats need better security
 - Improve harbor police patrol
- . Environmental
 - Concern about pollution in harbor: Water, marinas and on beaches
 - Need long-term pollution plan
 - Need harbor cleanup program
 - Concerned waterfront development will damage existing ecosystems
- . Development
 - Worried that encroachment by real estate interests will displace boating area
 - Worried that private marina encroachment into harbor is taking up inner harbor mooring space
 - Build condos elsewhere - concerned that waterfront development will damage ecosystems.
- . Positive Responses
 - Continue good work/management as is
 - Marina is attractive and well-kept
 - Dock system is good
 - Harbor Island is great; don't ruin it
 - Harbor is marina's prime asset
- . Management and Regulations
 - Assign same dock and mooring spaces each year
 - Landing float regulations should be enforced
 - Reissue permits for unoccupied moorings

- Boats are missing mooring permits
- Harbor Master should be available on weekends
- Prohibit fishing off docks
- Prohibit fireworks near boats
- Priority procedure for allocation of dock space unclear

. Fees

- Fees too high
- Stop raising fees
- Don't charge ramp fees to those who have already paid mooring fees
- Marina users fees should be raised and used for marina improvements
- Fees increase, but there are no facility improvements

. Priorities

- Keep harbor for people of Mamaroneck
- Don't push out small boat owners
- Don't push out senior citizens
- Restrict winter storage facilities to Village residents and those who moor boats in the harbor

. Other Concerns

- Build a pool
- Private marina infiltration
- Use Village's Rushmore property for a municipal marina
- Mamaroneck Beach and Yacht Club should be permitted to build a breakwater
- Dredging plan needed
- Town should run launch service for money
- Extend season of float availability

APPENDIX B
HARBOR TRAFFIC SURVEYS
SUMMER 1985
SUMMARY OF OBSERVATIONS

The nine one-hour boat counts were made on weekends at the times one could expect a high degree of boating activity.

These series of counts were made by Warren T. and Mildred L. Warnecke taken from a position S.E. of Red Nun Buoy #12, which is the narrowest point of the harbor channel at the dividing line between the inner and outer harbor limits.

All boats either leaving or entering the Mamaroneck Village Harbor were counted, and the total count was broken down into three categories of boat types: sail, power, other.

The last category included canoes, dinghies, tenders, kayacs - any craft paddled, rowed or tethered and hauled (i.e. dinghies serving as tenders).

Except when sailboards crossed the harbor channel at right angles on an off-shore breeze, traffic moved smoothly; and only on occasion was it observed to be a congested situation with four boats abreast in a channel "squeezed" by low tide.

One-Hour Counts Completed

	<u>1985¹</u>	<u>1983²</u>	<u>1980³</u>
Total Number of Boats Counted	1,078	3,928	3,339
Overall Average Per Hour	119.8	145.5	123.7
Overall Average Per Minute	2.00	2.43	2.06

1. 9 hour counts
2. 27 hour counts
3. 27 hour counts

The average 1985 appears lower than the 1980 and 1983 surveys for two reasons:

1. The 1985 count was for 9 hours while both the 1980 and 1983 counts were completed for 27 hours.
2. The 1985 count was completed in late summer while both the 1980 and 1983 counts were taken throughout the summer months.

APPENDIX B
(Cont'd)

MAMARONECK HARBOR BOAT TRAFFIC
Summer 1985

<u>Day</u>	<u>Time</u>	<u>Boats Per Hr.</u>	<u>Average Per Min.</u>
<u>August</u>			
Sat. 17	11:00 - 12:00	94	1.57
	12:00 - 1:00 p.m.	144	2.40
	1:00 - 2:00 p.m.	151	2:52
<u>September</u>			
Sun. 1	12:00 - 1:00 p.m.	148	2.46
	1:00 - 2:00 p.m.	135	2.25
Sat. 7	1:30 - 2:30 p.m.	86	1.43
	2:30 - 3:30 p.m.	106	1.77
	3:30 - 4:30 p.m.	107	1.78
Sat. 14	4:00 - 5:00 p.m.	108	1.80

SUMMARY: No. of boats counted - 1,078
Overall boats per hour - 119.78/hour
Overall boats per minute - 2.00/minute

APPENDIX C

SURVEY OF MARINAS, BOATYARDS AND CLUBS

The Village of Mamaroneck is currently preparing a Harbor Management Plan. The objectives of the Plan are to identify existing conditions and to establish policy guidelines for future use of Mamaroneck Harbor.

To assess public demand and concern for utilization of Mamaroneck's harbor resources, the following survey is intended to solicit information on demand for the Harbor and incorporate this information concerns into the context of the Harbor Management Plan.

Please answer the questions as appropriate.

1. How many boats were moored, berthed or dry-docked at your facility during the summer of 1985?
 - (a) Number of boats under 18 feet long _____
 - (b) Number of boats from 18 to 24 feet long _____
 - (c) Number of boats over 24 feet long _____
2. Is there space available at your facility for transient boaters?
Yes _____ No _____ How many _____
3. Is there a waiting list of persons who wish to moor/dock their boats at your facility?
Yes _____ No _____ How many _____
4. What is the rental fee schedule to dock/moor a boat at your facility?
5. Which of the following services are available at your facility?
 - (a) Toilets _____
 - (b) Showers _____
 - (c) Pumpout station _____
 - (d) Launching ramp _____ (launching fee _____)
 - (e) Parking facilities _____ (number of parking spaces _____)
 - (f) Dry-docking _____ (number of boats '85 season _____)
 - (g) Launching derreck or trolley hoist _____
 - (h) Private lockers _____
 - (i) Electricity for boats
afloat _____
ashore _____
 - (j) Complete gas, oil, diesel fuel _____
 - (k) Boat supply store _____
 - (l) Complete year-round, onshore sheltered storage
number of boats _____
fee schedule _____

SUMMARY OF RESPONSES TO SURVEY OF MARINAS, BOAT YARDS AND CLUBS

VILLAGE OF MAMARONECK
HARBOR MANAGEMENT PLAN

Number of Boats:

boats = 18'	385
18' boats = 24'	353
24' boats	191

Transient Boater Space	7
------------------------	---

Waiting List	196±
--------------	------

Rental Fee	Public	Private
	Avg. = \$270/boat	Avg. = \$1,397/boat
boats = 12'	\$10/ft.	\$96.25/ft.
12' boats = 16'	\$12/ft.	\$87.32/ft.
16' boats = 22'	\$15/ft.	\$75.42/ft.
22' boats	\$20/ft.	\$66.35/ft.

Facilities Available

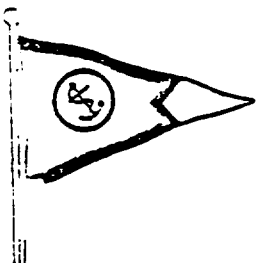
Toilets	6
Showers	4
Pumpout Stations	-
Launching Ramp	2
Parking Facilities	5
Dry Docking	3
Private Lockers	2
Electricity For Boats Afloat	4
Electricity for Boats Ashore	3
Complete Gas, Oil, Diesel Fuel	2
Boat Supply Store	3
Year-round Storage	0
Launching Dock	4

Comments:

1. Public facilities fees too low. Private marinas subsidizing public marinas.
2. Harbor needs breakwater.
3. To increase capacity of harbor use docks, not moorings.

Marinas, boat yards and boat clubs surveyed:

James Mancusi, Harbor Master
Mamaroneck Beach and Cabana Club
Shore Acres Point Corp
Nichols Yard
Mc. Michael
Post Road Boat Yard Inc.
Total Yatch Sales
Orienta Beach Club
Orienta Yacht Club



ORIENTA YACHT CLUB

MAMARONECK, N. Y.

17 December 1985

Mr. Robert E. Wardwell
Assistant Vice President
Director of Planning
CE Maguire, Inc.
One Court Street
New Britain, CT 06051

RECEIVED

DEC 23 1985

CE MAGUIRE, INC.
PLANNING DEPT.

Dear Mr. Wardwell:

Thank you for having extended us an opportunity to attend and participate in a workshop on Harbor Management Policies on Monday, December 16th, at the Coast Guard Auxiliary Building.

We were particularly impressed with your presentation which covered many facets of a Management or Master Plan. This approach soon elicited many suggestions and comments from the audience. Ms. Riklin also made a number of significant remarks.

Enclosed is a survey sheet covering the various facilities provided by the Orienta Yacht Club for its members and transient users. Should you or others in your organization require additional information, or would be interested in learning how the OYC can make a greater contribution to the Village of Mamaroneck ... we shall be delighted to meet with you at a time when you may care to inspect our facilities.

Commodore Arthur M. Spence and I wish you and your organization every success in the formulation and implementation of a Harbor Management Plan for the Village of Mamaroneck. If we can be of any further assistance, please feel free to contact me at 411 Quaker Ridge Road, New Rochelle, New York 10804. Or, call me at 914-632-5755.

Sincerely,

Donald F. Lane, Chrm.
OYC Membership Committee

Enclosure

POST ROAD BOAT YARD, INC.

QUALITY YACHT SERVICE

RECEIVED

DEC 24 RECU

December 20th, 1985

GE MAGNIE, INC.
PLANNING DEPT.

Harbor Commission and Bob Wardwell
Village Hall
Mamaroneck, N. Y. 10543

Gentlemen:

We enjoyed the opportunity to make our views known on Monday night December 16th. Thank you.

To reiterate and confirm these discussions: We are in favor of the following expanded uses of Mamaroneck Harbor:

- 1) "Star" type moorings; 2) A marina for boats up to 30 or 35' in length around the perimeter of the West Basin;
- 3) A much-improved launching ramp and trailer storage facility located on Harbor Island; 4) Dredging of the harbor; 5) Launch service and better utilization of the outer harbor from a location on Harbor Island;
- 6) A guest dock located at the old cement plant making certain it does not block our slip customers;
- 7) A method to control the tons of debris which come down the Mamaroneck River.

We do feel strongly that if a municipal marina is constructed, rates should be realistic and not "give away".

E.g., the private industry is renting slips at \$74.50/ft; a municipal facility should charge at least \$55/ft. For wet storage we are charging \$29/ft; municipal rates should be at least \$24 - \$25/ft. There is no way otherwise that the private segment can compete.

We are against any further regulation of the harbor, and against any additional complications in the permit process.

There are two concerns which were not discussed:

- 1) Movement of Federal Channel lines legalizing our marina configuration. This naturally is of paramount importance to us since our property is now in a marina zone and as such is designated only for boating use.

Brewer Marina Inc.
Glen Cove, NY
516-671-5563

Cove Haven Corporation
Barrington, R.I.
401-246-1600

Bruce & Johnson's Marine
Branford, Conn.
203-488-8329

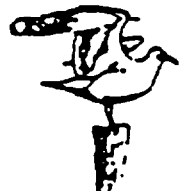
Pilot's Point Marina North
Westbrook, Conn.
203-399-7906

Pilot's Point Marina South
Westbrook, Conn.
203-399-7906

Brewer's Sakonnet Marine
Portsmouth, R.I.
401-683-3551

Brewer's Yacht Yard
Warwick, R.I.
401-884-0544

Brewer's Yacht Yard
Greenport, NY
516-477-9594



155 EAST POST ROAD
MAMARONECK, NY 10543
914-698-0295

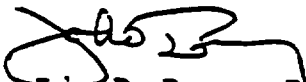
PAGE 2

2) The possible sale of slips as condominiums. We would be against any restriction on the above. The time may arrive when most boat owners desire to own their slip (much as most apartment renters have purchased their apartments). We want to accommodate our customers if this occurs.

Thank you for taking the time to read this letter. If you have any questions or if we can help you in any way please call.

Very truly yours,

POST ROAD BOAT YARD , INC.



John D. Brewer Jr.

President

APPENDIX D
COASTAL TOWN SURVEY

- 25 Long Island Sound coastal towns telephoned.
- 11 Have public marina facilities
- 8 Towns with public marinas participated in complete survey.
- 6 Towns - facilities for residents only
- 7 Towns - marinas managed by Parks & Recreation Depts.
- 1 Town has in water winter storage.
- 8 Towns have police department harbor patrols.
- 7 Towns - harbor master does not manage public marinas
- 1 Town has dry storage with own trailer at \$2.50/ft. Public launch fee \$15.00 (2 towns).
- 7 Towns harbor master - allocates moorings/polices area.

Fee Analysis

Slip fees - Village of Mamaroneck public slip fees appear similar to other coastal town public marinas mooring fees.

Coastal Towns Surveyed

New Rochelle, NY
Port Chester, NY
Greenwich, CT
Stamford, CT
Darien, CT
Norwalk, CT
Westport, CT
Fairfield, CT
Bridgeport, CT
Stratford, CT
Milford, CT
West Haven, CT
New Haven, CT
East Haven, CT
Branford, CT
Guilford, CT
Madison, CT
Clinton, CT

APPENDIX D
(Continued)

Westbrook, CT
Oly Lyme, CT
East Lyme, CT
Waterford, CT
New London, CT
Stonington, CT
Groton, CT

APPENDIX E

SUMMARY OF DOCK AND MOORING PERMIT ANALYSIS

SUMMARY - BOAT SIZES - MAMARONECK HARBOR

	<u>Dock</u>	<u>Moorings</u>	<u>Boat Yards</u>	<u>Total</u>
Size	#	#	#	%
B = 10'	43	1	0	44
10' B = 18'	304	23	79	406
18' B = 24'	57	133	169	355
24' B = 36'	2	252	130	384
B = 36'	-	46	40	86
	<u>406</u>	<u>455</u>	<u>414</u>	<u>1,275</u>
Unclassified	2	27	126	
Total:	408	482	540	1,430

	<u>Residents</u>	<u>Non-Residents</u>	<u>Total</u>
Moorings	186	296	482
Public Docks	377	31	408
Private Boat Clubs	<u>242</u>	<u>298</u>	<u>540</u>
Total	805 (56%)	625 (44%)	1,430 (100%)

APPENDIX F

BUILDING PERMIT APPLICATION PACKAGE

- . U.S. Army Corps of Engineers Regulatory Program
- . New York State Department of State and Federal Consistency Assessment Form
- . New York State Department of Environmental Conservation Permit Application

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT

1. Name: _____
(please print)

2. Address: _____

3. Telephone: Area Code (_____)

B. PROPOSED ACTIVITY

1. Brief description of activity: _____

2. Purpose of activity: _____

3. Location of activity: _____

County

City, Town or Village

Street or Site Description

4. Type of federal permit/license required: _____

5. Federal application number, if known: _____

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known: _____

C. COASTAL ASSESSMENT Check either "Yes" or "No" for each of the following questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

YES NO

1. Will the proposed activity result in any of the following:

- a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43).....
- b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44).....
- c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1).....
- d. Reduction of existing or potential public access to or along coastal waters? (19, 20).....
- e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9, 10)...
- f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29).....
- g. Siting of a facility essential to the generation or transmission of energy? (27).....
- h. Mining, excavation, or dredging activities, or the placement of dredged or fill materials in coastal waters? (15, 35).....
- i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (15, 35).
- j. Draining of stormwater runoff or sewer overflows into coastal waters? (33).....
- k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39).
- l. Adverse effect upon land or water uses within the State's small harbors? (4).....

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:

- a. State designated freshwater or tidal wetland? (44).....
- b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17).....
- c. State designated significant fish and/or wildlife habitat? (7).....
- d. State designated significant scenic resource or area? (24).....
- e. State designated important agricultural lands? (26).....
- f. Beach, dune or barrier island? (12).....
- g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3).....
- h. State, county, or local park? (19, 20).....
- i. Historic resource listed on the National or State Register of Historic Places? (23).....

3. Will the proposed activity require any of the following:

YES NO

- a. Waterfront site? (2, 21, 22).....
- b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (3).....
- c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16).....
- d. State water quality permit or certification? (30, 38, 40).....
- e. State air quality permit or certification? (41, 43).....

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document*)....

ADDITIONAL STEPS

1. If all of the questions in Section C are answered "No", then the applicant or agent shall complete Section E and submit the documentation required by Section F.
2. If any of the questions in Section C are answered "Yes", then the applicant or agent is advised to consult the CMP or, where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. In the space provided below or on a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agent shall complete Section E and submit the documentation required by Section F.

CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: _____

Address: _____

Telephone: Area Code () _____

Applicant/Agent's Signature: _____ Date: _____

Refer to attached statements.

SUBMISSION REQUIREMENTS

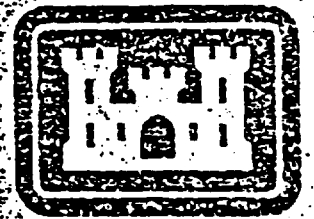
1. The applicant or agent shall submit the following documents to the New York State Department of State, Office of Local Government Services, Coastal Management Program, 162 Washington Avenue, Albany, New York 12231.
 - a. Original signed form.
 - b. Copy of the completed federal agency application.
 - c. Other available information which would support the certification of consistency.
2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.
3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 476-3642.

*These state and local documents are available for inspection at the offices of many federal agencies, Department of Environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

United States Army Corps of Engineers

Regulatory Program

Applicant Information



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Explanation of Some Commonly Used Terms

Certain terms which are closely associated with the regulatory program are explained briefly in this section. If you need more detailed definitions, refer to the Code of Federal Regulations (33 CFR Parts 320 through 330) or contact a Corps district regulatory office.

Activity(ies) as used in this pamphlet includes structures (for example a pier, wharf, bulkhead, or jetty) and work (which includes dredging, disposal of dredged material, filling, excavation or other modification of a navigable water of the United States).

Navigable Waters of the United States are those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past or may be susceptible to use to transport interstate or foreign commerce. These are waters that are navigable in the traditional sense where permits are required for certain activities pursuant to Section 10 of the Rivers and Harbors Act. This term should not be confused with the term *waters of the United States* below.

Waters of the United States is a broader term than navigable waters of the United States defined above. Included are adjacent wetlands and tributaries to navigable waters of the United States and other waters where the degradation or destruction of which could affect interstate or foreign commerce. These are the waters where permits are required for the discharge of dredged or fill material pursuant to Section 404 of the Clean Water Act.

Pre-application Consultation is one or more meetings between members of the district engineer's staff and an applicant and his agent or his consultant. A pre-application consultation is usually related to applications

for major activities and may involve discussion of alternatives, environmental documents, National Environmental Policy Act procedures, and development of the scope of the data required when an environmental impact statement is required.

Public Hearings may be held to acquire information and give the public the opportunity to present views and opinions. The Corps may hold a hearing or participate in joint public hearings with other Federal or state agencies. The district engineer may specify in the public notice that a hearing will be held. In addition, any person may request in writing during the comment period that a hearing be held. Specific reasons must be given as to the need for a hearing. The district engineer may attempt to resolve the issue informally or he may set the date for a public hearing. Hearings are held at times and places that are convenient for the interested public. Very few applications involve a public hearing.

The Public Interest Review is the term which refers to the evaluation of a proposed activity to determine probable impacts. Expected benefits are balanced against reasonably foreseeable detriments. All relevant factors are weighed. Corps policy is to provide applicants with a timely and carefully weighed decision which reflects the public interest.

Public Notice is the primary method of advising interested public agencies and private parties of the proposed activity and of soliciting comments and information necessary to evaluate the probable impact on the public interest. Upon request, anyone's name will be added to the distribution list to receive public notices.

Waterbody is a river, creek, stream, lake, pool, bay, wetland, marsh, swamp, tidal flat, ocean, or other water area.

Questions That Are Frequently Asked

Various questions are often asked about the regulatory program. It is hoped that these answers will help you to understand the program better.

Q. When should I apply for a Corps permit?

A. Since two to three months is normally required to process a routine application involving a public notice, you should apply as early as possible to be sure you have all required approvals before your planned commencement date. For a large or complex activity that may take longer, it is often helpful to have a "pre-application consultation" or informal meeting with the Corps during the early planning phase of your project. You may receive helpful information at this point which could prevent delays later. When in doubt as to whether a permit may be required or what you need to do, don't hesitate to call a district regulatory office.

Q. I have obtained permits from local and state governments. Why do I have to get a permit from the Corps of Engineers?

A. It is possible you may not have to obtain an individual permit, depending on the type or location of work. The Corps has many general permits which authorize minor activities without the need for individual processing. Check with your Corps district regulatory office for information on general permits. When a general permit does not apply, you may still be required to obtain an individual permit.

Q. What will happen if I do work without getting a permit from the Corps?

A. Performing unauthorized work in waters of the United States or failure to comply with terms of a valid permit can have

serious consequences. You would be in violation of Federal law and could face stiff penalties, including fines and /or requirements to restore the area.

Enforcement is an important part of the Corps regulatory program. Corps surveillance and monitoring activities are often aided by various agencies, groups, and individuals, who report suspected violations. When in doubt as to whether a planned activity needs a permit, contact the nearest district regulatory office. It could save a lot of unnecessary trouble later.

Q. How can I obtain further information about permit requirements?

A. Information about the regulatory program is available from any Corps district regulatory office. Addresses and telephone numbers of offices are listed at the back of this pamphlet. Information may also be obtained from the water resource agency in your state.

Q. Why should I waste my time and yours by applying for a permit when you probably won't let me do the work anyway?

A. Nationwide, only three percent of all requests for permits are denied. Those few applicants who have been denied permits usually have refused to change the design, timing, or location of the proposed activity. When a permit is denied, an applicant may redesign the project and submit a new application. To avoid unnecessary delays pre-application conferences, particularly for applications for major activities, are recommended. The Corps will endeavor to give you helpful information, including factors which will be considered during the public interest review, and alternatives to consider that may prove to be useful in designing a project.

Q. What is a wetland and what is its value?

A. Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs and similar areas. A significant natural resource, wetlands serve important functions relating to fish and wildlife; food chain production; habitat; nesting; spawning; rearing and resting sites for aquatic and land species; protection of other areas from wave action and erosion; storage areas for storm and flood waters; natural recharge areas where ground and surface water are interconnected; and natural water filtration and purification functions.

Although individual alterations of wetlands may constitute a minor change, the cumulative effect of numerous changes often results in major damage to wetland resources. The review of applications for alteration of wetlands will include consideration of whether the proposed activity is dependent upon being located in an aquatic environment.

Q. How can I design my project to eliminate the need for a Corps permit?

A. If your activity is located in an area of tidal waters, the best way to avoid the need for a permit is to select a site that is above the high tide line and avoids wetlands or other waterbodies. In the vicinity of fresh water, stay above ordinary high water and avoid wetlands adjacent to the stream or lake. Also, it is possible that your activity is exempt and does not need a Corps permit or that it has been authorized by a nationwide or regional general permit. So, before you build, dredge or fill, contact the Corps district regulatory office in your area for specific information about location, exemptions, and regional and nationwide general permits.

General

The application form used to apply for a permit is Engineer Form 4345, *Application for a Department of the Army Permit*. You can obtain the application from one of the Corps of Engineers district regulatory offices listed in the back of this pamphlet. Some offices may use a slightly modified form for joint processing with a state agency; however, the required information is basically the same. It is important that you provide complete information in the requested format. If incomplete information is provided, processing of your application will be delayed. This information will be used to determine the appropriate form of authorization, and to evaluate your proposal. Some categories of activities have been previously authorized by nationwide or regional permits, and no further Corps approvals are required. Others may qualify for abbreviated permit processing, with authorizations in the form of letters of permission, in which a permit decision can usually be reached in less than 30 days. For other activities, a Public Notice may be required to notify Federal, state, and local agencies, adjacent property owners, and the general public of the proposal to allow an opportunity for review and comment or to request a public hearing. Most applications involving Public Notices are completed within four months and many are completed within 60 days.

The district engineer will begin to process your application immediately upon receipt of all required information. You will be sent an acknowledgement of its receipt and the application number assigned to your file. You should refer to this number when inquiring about your application. Your proposal will be reviewed, balancing the need and expected benefits against the probable impacts of the work, taking into consideration all comments received and other relevant factors. This process is called the *public interest review*. The Corps goal is to reach a decision regarding permit issuance or denial within 60 days of receipt of a complete application. However, some complex activities, issues, or requirements of law may prevent the district engineer from meeting this goal.

For any specific information on the evaluation process, filling out the application forms, or the status of your application, you should contact the regulatory branch of the Corps of Engineers district office which has jurisdiction over the area where you plan to do the work.

**Typical Processing Procedure for a
Standard Individual Permit**

1. Preapplication consultation (optional)
2. Applicant submits ENG Form 4345 to district regulatory office*
3. Application received and assigned identification number
4. Public notice issued (within 15 days of receiving all information)
5. 15 to 30 day comment period depending upon nature of activity
6. Proposal is reviewed** by Corps and:
 - Public
 - Special interest groups
 - Local agencies
 - State agencies
 - Federal agencies
7. Corps considers all comments
8. Other federal agencies consulted, if appropriate
9. District engineer may ask applicant to provide additional information
10. Public hearing held, if needed
11. District engineer makes decision
12. Permit issued
 - or
 - Permit denied and applicant advised of reason

*A local variation, often a joint federal-state application form may be submitted.

**Review period may be extended if applicant fails to submit information or due to requirements of certain laws.

Evaluation Factors

The decision whether to grant or deny a permit is based on a public interest review of the probable impact of the proposed activity and its intended use. Benefits and detriments are balanced by considering effects on items such as:

- conservation
- economics
- aesthetics
- general environmental concerns
- wetlands
- cultural values
- fish and wildlife values
- flood hazards
- floodplain values
- food and fiber production
- navigation
- shore erosion and accretion
- recreation
- water supply and conservation
- water quality
- energy needs
- safety
- needs and welfare of the people
- considerations of private ownership

The following general criteria will be considered in the evaluation of every application:

- ☐ the relative extent of the public and private need for the proposed activity;
- ☐ the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed activity; and
- ☐ the extent and permanence of the beneficial and/or detrimental effects which the proposed activity is likely to have on the public and private uses to which the area is suited.

Section 404(b) (1) of the Clean Water Act

If your project involves the discharge of dredged or fill material, it will be necessary for the Corps to evaluate your proposed activity under the Section 404(b)(1) guidelines prepared by the Environmental Protection Agency. The guidelines restrict discharges into aquatic areas where less environmentally damaging, practicable alternatives exist.

Forms and Permits

The following forms apply to the permit process:

Application

The form that you will need to initiate the review process is ENG Form 4345 or a joint Federal-state application that may be available in your state. The appropriate form may be obtained from the district regulatory office which has jurisdiction in the area where your proposed project is located.

Individual Permits

An individual permit may be issued as either ENG Form 1721, the standard permit, or as a Letter of Permission.

- ☐ A standard permit is one processed through the typical review procedures, (see page 7) which include public notice, opportunity for a public hearing, and receipt of comments. It is issued following a case-by-case evaluation of a specific activity.
- ☐ If work is minor or routine with minimum impacts and objections are unlikely, then it may qualify for a Letter of Permission (LOP). An LOP can be issued much more quickly than a standard permit since an individual public notice is not required. The District Engineer will notify you if your proposed activity qualifies for an LOP.

General Permits

In many cases the formal processing of a permit application is not required because of general permits already issued to the public at large by the Corps of Engineers. These are issued on a regional and nationwide basis.

Separate applications may not be required for activities authorized by a general permit; nevertheless, reporting may be required. For specific information on general permits, contact a district regulatory office.

ENG Form 4336

The third form, ENG Form 4336, is used to assist with surveillance for unauthorized activities. The form, which contains a description of authorized work, should be posted at the site of an authorized activity. If the Corps decides it is appropriate for you to post this form, it will be furnished to you when you receive your permit.

Fees. Fees are required for most permits. \$10.00 will be charged for a permit for a non-commercial activity; \$100.00 will be charged for a permit for a commercial or industrial activity. The district engineer will make the final decision as to the amount of the fee. Do not send a fee when you submit an application. When the Corps issues a permit, you will be notified and asked to submit the required fee payable to the Treasurer of the United States. No fees are charged for transferring a permit from one property owner to another, for Letters of Permission, or for any activities authorized by a general permit or for permits to governmental agencies.

Instructions for Preparing an Application

The instructions given below, together with the sample application and drawings, should help in completing the required application form. If you have additional questions, do not hesitate to contact the district regulatory office.

Block Number 1. Application Number. Leave this block blank. When your completed application is received, it will be assigned a number for identification. You will be notified of the number in an acknowledgement letter. Please refer to this number in any correspondence or inquiry concerning your application.

Block 2. Name and address of applicant(s). Fill in name, mailing address, and telephone number(s) for all applicants. The telephone number(s) should be a number where you can be reached during business hours. If space is needed for additional names, attach a sheet of white, 8½ x 11 inch paper labeled "Block 2 Continued."

Block 3. Name, address and title of authorized agent. It is not necessary to have an agent represent you; however, if you do, fill in the agent's name, address, title and telephone number(s). If your agent is submitting and signing the application, you must fill out and sign the Statement of Authorization in Block 3.

Block 4. Detailed description of proposed activity. The written description and the drawings are the most important parts of the application. If there is not enough space in Block 4, (a), (b) or (c) attach additional sheet(s) of white, 8½ x 11 inch paper labeled "Block 4 Continued."

- a. **Activity.** Describe the overall activity. Give the approximate dimensions of structures, fills, excavations (lengths, widths, heights or depths).

- b. **Purpose.** Describe the purpose, need and intended use (public, private, commercial, or other use) of the proposed activity. Include a description of related facilities, if any, to be constructed on adjacent land. Give the date you plan to begin work on the activity and the date work is expected to be completed.

- c. **Discharge of Dredged or Fill Material.** If the activity will involve the discharge of dredged or fill material, describe the type (rock, sand, dirt, rubble, etc.), quantity (in cubic yards), and mode of transportation to the discharge site.

Block 5. Names and addresses of adjoining property owners, lessees, etc. whose property adjoins the waterbody. List complete names, addresses and zip codes of adjacent property owners (both public and private), lessee, etc., whose property also adjoins the waterbody or wetland, in order that they may be notified of the proposed activity. This information is usually available at the local tax assessor office. If more space is needed attach a sheet of white, 8½ x 11 inch paper labeled "Block 5 Continued."

Block 6. Waterbody and location on waterbody where activity exists or is proposed. Fill in the name of the waterbody and the river mile (if known) at the location of the activity. Include easily recognizable landmarks on the shore of the waterbody to aid in locating the site of the activity.

Block 7. Location and land where activity exists or is proposed. This information is used to locate the site. Give the street address of the property where the proposed activity will take place. If the site does not have a street address, give the best descriptive location (name or waterbody), names and/or numbers of roads or highways, name of nearest community or town, name of county and state, and directions, such as 2 miles east of Brown's Store on Route 105.

Do not use your home address unless that is the location of the proposed activity. Do not use a post office box number.

Block 8. Information about completed activity. Provide information about parts of the activity which may be complete. An activity may have been authorized by a previously issued permit, may exist from a time before a Corps permit was required or may be constructed on adjacent upland.

Block 9. Information about approvals or denials by other government agencies. You may need approval or certification from other Federal, interstate, state, or local government agencies for the activity described

in your application. Applications you have submitted, and approvals, certifications, or disapprovals that you have received should be recorded in Block 9. It is not necessary to obtain other Federal, state, and local permits before applying for a Corps of Engineers permit.

Block 10. Signature of applicant or agent. The application must be signed in Block 10 by the owner, lessee, or a duly authorized agent. The person named in Block 3 will be accepted as the officially designated agent of the applicant. The signature will be understood to be affirmation that the applicant possesses the requisite property interest to undertake the proposed activity.

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(43 CFR 323)

OMB APPROVAL NO. 0702-0036
Expires 30 June 1986

The Department of the Army permit program is authorized by Section 10 of the River and Harbor Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

A set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. APPLICATION NUMBER (To be assigned by Corps)

2. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT

None

3. NAME AND ADDRESS OF APPLICANT

Fred R. Harris
West Branch Road
Pine Harbor, Maryland 21703

Telephone no. during business hours

A/C () _____ (Residence)

A/C () _____ (Office)

Statement of Authorization: I hereby designate and authorize _____

to act in my behalf as my

agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

Telephone no. during business hours

A/C (301) 585-2779 (Residence)
C () _____ (Office)

SIGNATURE OF APPLICANT

DATE

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

ACTIVITY

Build timber bulkhead and pier and fill.

5. PURPOSE

To provide boat access and prevent erosion of shoreline at my place of residence.

6. DISCHARGE OF DREDGED OR FILL MATERIAL

Approximately 200 cubic yards of upland fill will be placed between new bulkhead and existing shoreline.

NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY

Mary L. Clark
850 West Branch Road
Blue Harbor, Maryland 21703

(301) 585-8830

Harry N. Hampton
854 West Branch Road
Blue Harbor, Maryland 21703

(301) 585-3676

WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED

West Branch of the Haven River on Blue Harbor.

LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED

ADDRESS:

2 West Branch Road

STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION

King Edward, Maryland 21703
COUNTY STATE ZIP CODE

Town of Blue Harbor

CAL GOVERNING BODY WITH JURISDICTION OVER SITE

3. Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO
If answer is "Yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.

4. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, charges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
Town of Blue Harbor	Zoning	BH25172	6/20/82	6/30/82	
Md DNR	Certification	DNR258WQ	6/11/82	8/12/82	

This application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

Frederick R. Harris
SIGNATURE OF APPLICANT

Oct. 15, 1982
DATE

SIGNATURE OF AGENT

DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 3 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

Do not send a permit processing fee with this application. The appropriate fee will be assessed when a permit is issued.

General Information

Three types of drawings—Vicinity, Plan, and Elevation—are required to accurately depict activities (See sample drawings on pages 16 and 17).

Submit one original, or good quality copy, of all drawings on 8½ × 11 inch white paper (tracing cloth or film may be used). Submit the fewest number of sheets necessary to adequately show the proposed activity. Drawings should be prepared in accordance with the general format of the samples, using block style lettering. Each page should have a title block. See check list below. Drawings do not have to be prepared by an engineer, but professional assistance may become necessary if the project is large or complex.

Leave a 1-inch margin at the top edge of each sheet for purposes of reproduction and binding.

In the title block of each sheet of drawings identify the proposed activity and include the name of the body of water; river mile (if applicable); name of county and state; name of applicant; number of the sheet and total number of sheets in set; and date the drawing was prepared.

Since drawings must be reproduced, use heavy dark lines. Color shading cannot be used; however, dot shading, hatching, or similar graphic symbols may be used to clarify line drawings.

Vicinity Map

The vicinity map you provide will be printed in any public notice that is issued and used by the Corps of Engineers and other reviewing agencies to locate the site of the proposed activity. You may use an existing road map or U.S. Geological Survey topographic map (scale 1:24,000) as the vicinity map. Please include sufficient details

to simplify locating the site from both the waterbody and from land. Identify the source of the map or chart from which the vicinity map was taken and, if not already shown, add the following:

- ☐ location of activity site (draw an arrow showing the exact location of the site on the map).
- ☐ latitude, longitude, river mile, if known, and/or other information that coincides with Block 6 on the application form.
- ☐ name of waterbody and the name of the larger creek, river, bay, etc., that the waterbody is immediately tributary to.
- ☐ names, descriptions and location of landmarks.
- ☐ name of all applicable political (county, parish, borough, town, city, etc.) jurisdictions.
- ☐ name of and distance to nearest town, community, or other identifying locations.
- ☐ names or numbers of all roads in the vicinity of the site.
- ☐ north arrow.
- ☐ scale.

Plan View

The plan view shows the proposed activity as if you were looking straight down on it from above. Your plan view should clearly show the following:

- ☐ Name of waterbody (river, creek, lake, wetland, etc.) and river mile (if known) at location of activity.
- ☐ Existing shorelines.
- ☐ Mean high and mean low water lines and maximum (spring) high tide line in tidal areas.
- ☐ Ordinary high water line and ordinary low water line if the proposed activity is located on a non-tidal waterbody.

- ☐ Average water depths around the activity.
- ☐ Dimensions of the activity and distance it extends from the high water line into the water.
- ☐ Distances to nearby Federal projects, if applicable.
- ☐ Distance between proposed activity and navigation channel, where applicable.
- ☐ Location of structures, if any, in navigable waters immediately adjacent to the proposed activity.
- ☐ Location of any wetlands (marshes, swamps, tidal flats, etc.)
- ☐ North arrow.
- ☐ Scale.
- ☐ If dredged material is involved, you must describe the type of material, number of cubic yards, method of handling, and the location of fill and spoil disposal area. The drawing should show proposed retention levees, weirs, and/or other means for retaining hydraulically placed materials.
- ☐ Mark the drawing to indicate previously completed portions of the activity.

Elevation and/or Cross Section View

The elevation and/or cross section view is a scale drawing that shows the side, front, or rear of the proposed activity. If a section view is shown, it represents the proposed structure as it would appear if cut internally for display. Your elevation should clearly show the following:

- ☐ Water elevations as shown in the plan view.

- ☐ Water depth at waterward face of proposed activity or, if dredging is proposed, dredging and estimated disposal grades.
- ☐ Dimensions from mean high water line (in tidal waters) for proposed fill or float, or high tide line for pile supported platform. Describe any structures to be built on the platform.
- ☐ Cross section of excavation or fill, including approximate side slopes.
- ☐ Graphic or numerical scale.
- ☐ Principal dimensions of the activity.

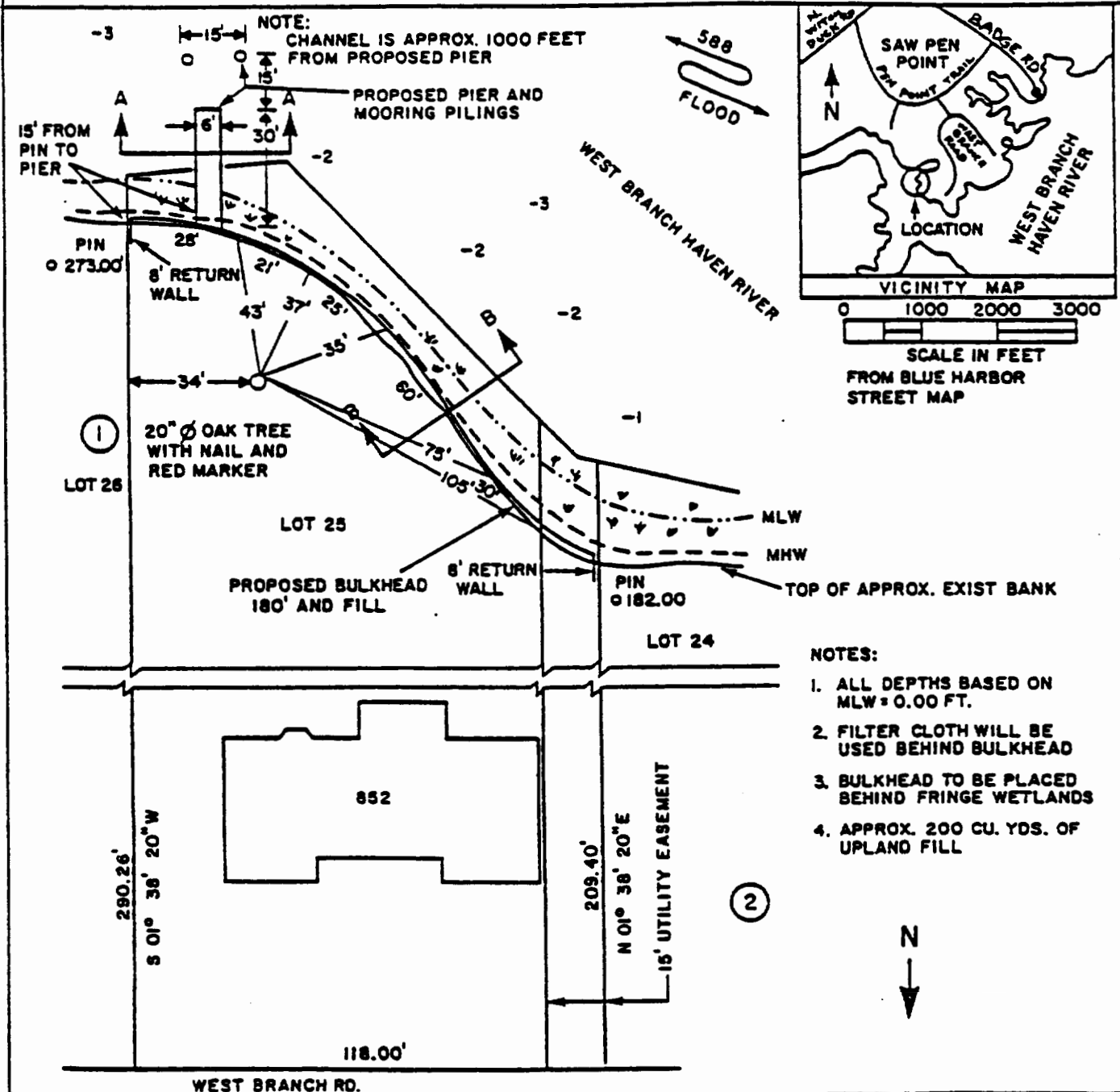
Notes on Drawings*

- ☐ Names of adjacent property owners who may be affected. Complete names and addresses should be shown in Block 5 on ENG Form 4345.
- ☐ Legal property description: Number, name of subdivision, block and lot number. Section, Township and Range (if applicable) from plot, deed or tax assessment.
- ☐ Photographs of the site of the proposed activity are not required; however, pictures are helpful and may be submitted as part of any application.

*Drawings should be as clear and simple as possible (i.e., not too "busy").

SAMPLE DRAWINGS FOR A PERMIT APPLICATION

NOTE: THE DRAWINGS SUBMITTED NEED NOT BE PREPARED BY A PROFESSIONAL DRAFTSMAN AS IN THESE SAMPLES.



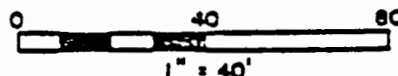
PURPOSE: PREVENT EROSION AND PROVIDE BOATING ACCESS

DATUM: MLW

ADJACENT PROPERTY OWNERS:

1. MARY L. CLARK
2. HARRY N. HAMPTON
- 3.

PLAN VIEW



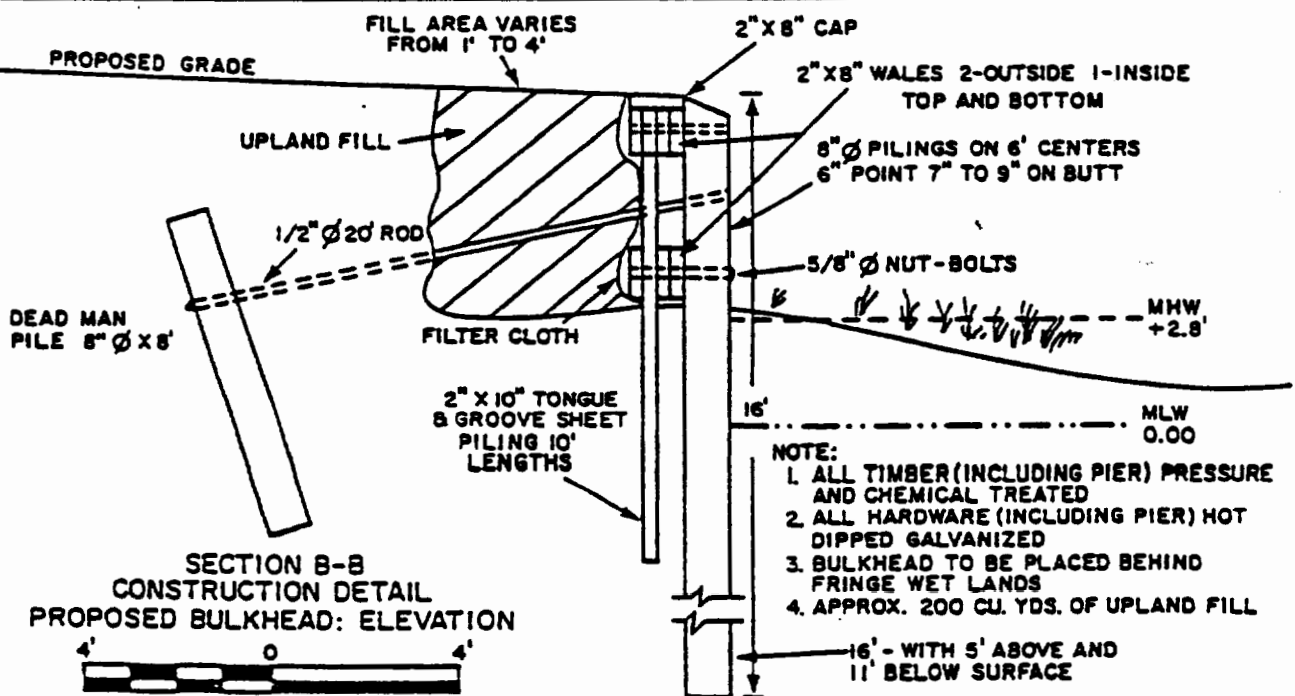
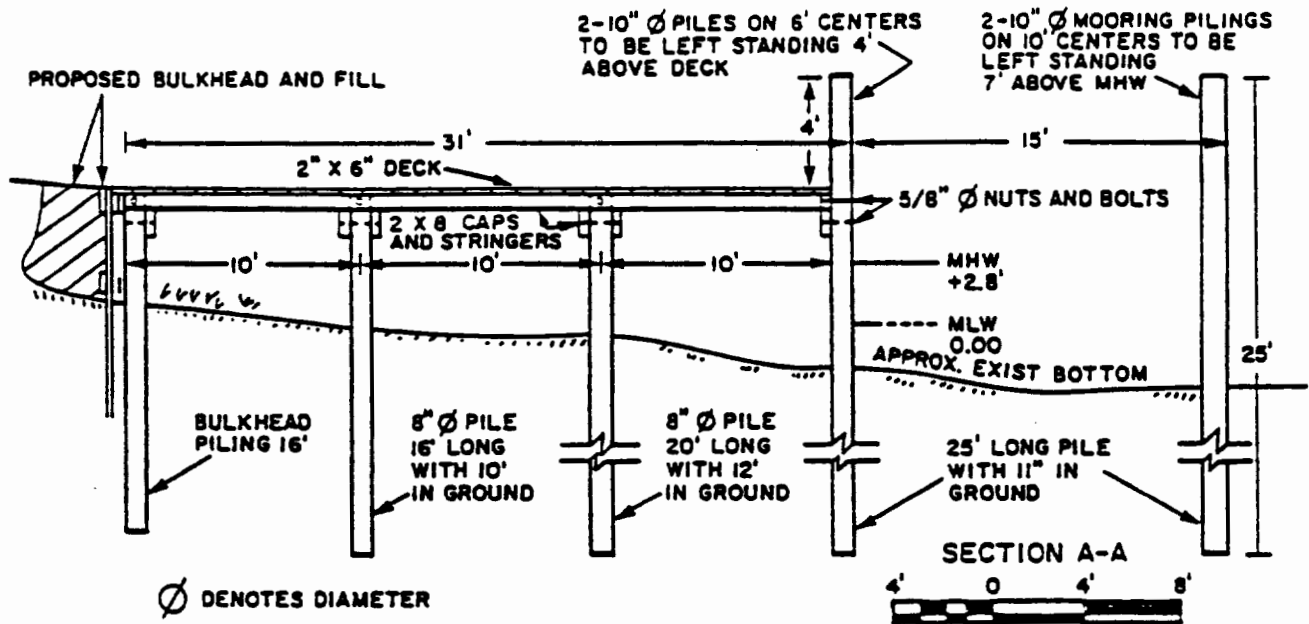
FRED R. HARRIS
852 WEST BRANCH ROAD
BLUE HARBOR, MD 21703

PROPOSED BULKHEAD PIER AND FILL

IN: WEST BRANCH HAVEN RIVER
AT: BLUE HARBOR

COUNTY OF: KING EDWARD STATE: N
APPLICATION BY: FRED R. HARRIS

SHEET 1 OF 2 DATE 10-16-1



PURPOSE: PREVENT EROSION AND PROVIDE BOATING ACCESS

DATUM: MLW

ADJACENT PROPERTY OWNERS:

1. MARY L. CLARK
2. HARRY N. HAMPTON
- 3.

SECTION VIEWS

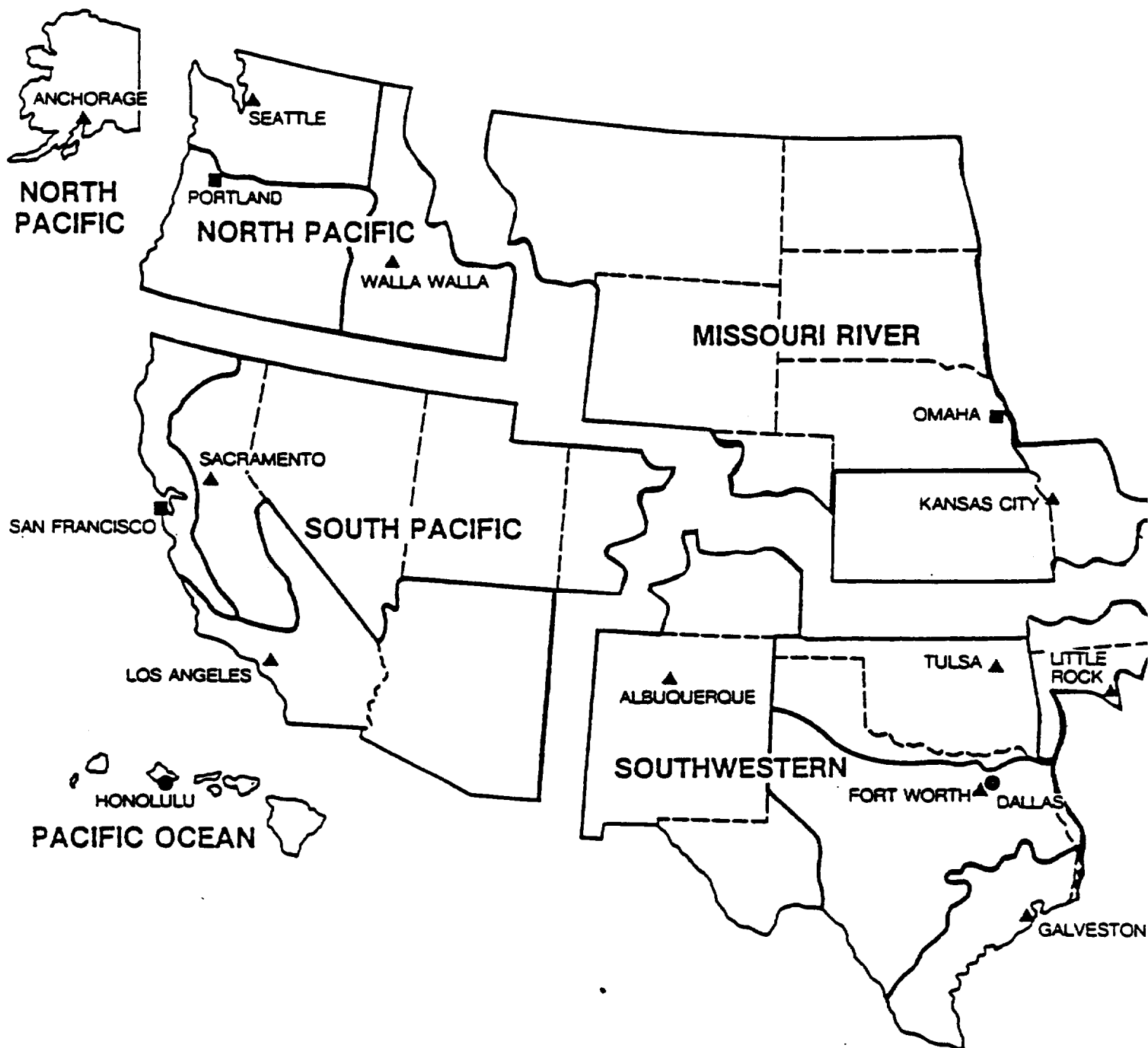
FRED R. HARRIS
852 WEST BRANCH ROAD
BLUE HARBOR, MD 21703

PROPOSED BULKHEAD PIER AND FILL

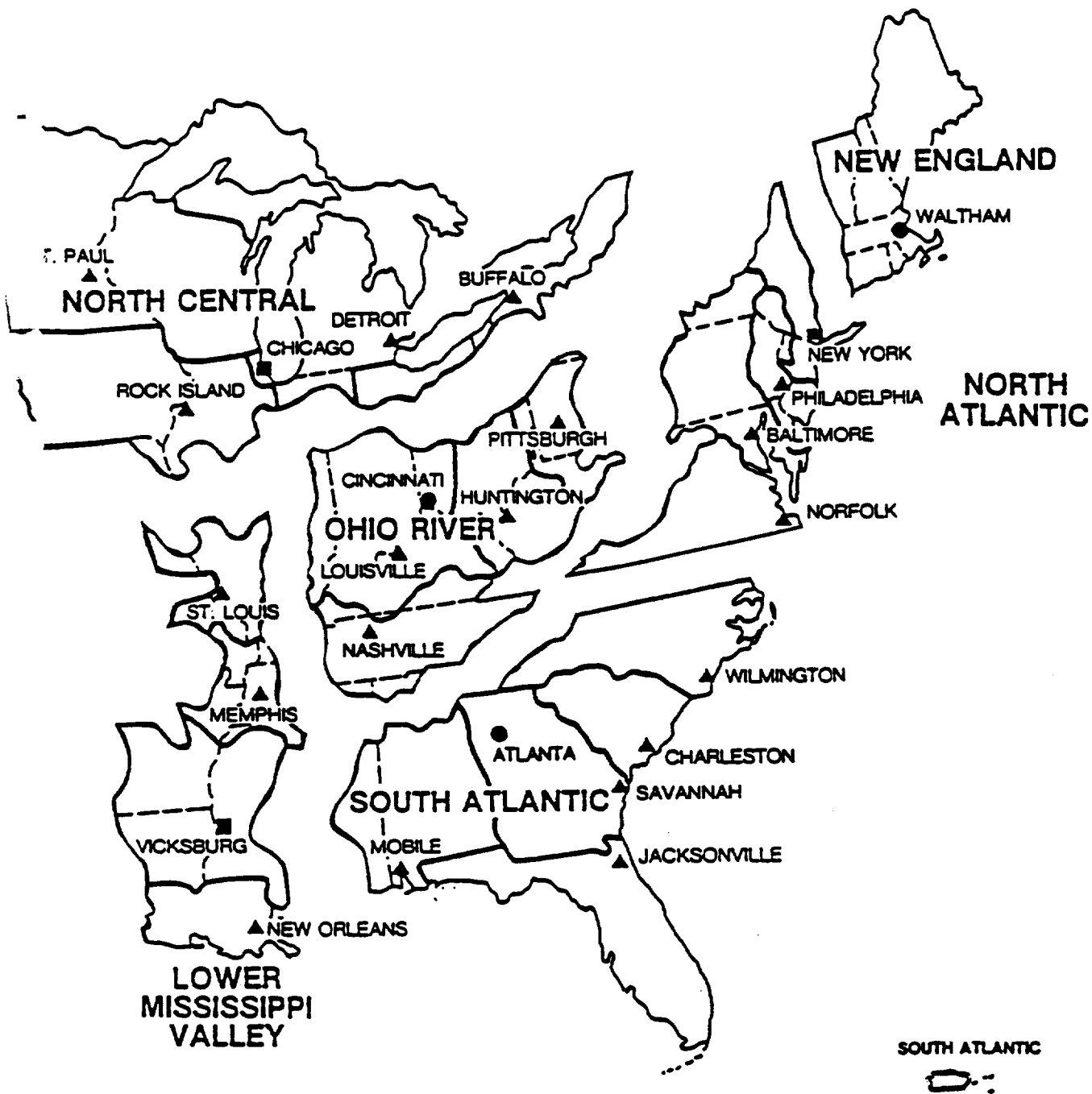
IN: WEST BRANCH HAVEN RIVER
AT: BLUE HARBOR
COUNTY OF: KING EDWARD STATE: MD
APPLICATION BY: FRED R. HARRIS

SHEET 2 OF 2 DATE 10-16-82

VISIONS AND DISTRICTS FOR REGULATORY ACTIVITIES



- DIVISION AND DISTRICT HEADQUARTERS
- DIVISION HEADQUARTERS
- ▲ DISTRICT HEADQUARTERS
- STATE BOUNDARIES
- DISTRICT BOUNDARIES



In Iowa the eastern bank of the Missouri River is regulated by the Omaha office.

LOCATIONS OF REGULATORY OFFICES

Address correspondence to:

**The District Engineer
U.S. Army Engineer
District**

Please include attention
line in address.

ALASKA

P.O. Box 898
Anchorage, AK
99506-0898
Attention: NPACO-RF
907/753-2712

ALBUQUERQUE

P.O. Box 1580
Albuquerque, NM
87103-1580
Attention: SWACO-OR
505/766-2776

BALTIMORE

P.O. Box 1715
Baltimore, MD 21203-1715
Attention: NABOP-R
301/962-3670
*Joint application with
New York, Maryland*

BUFFALO

1776 Niagara Street
Buffalo, NY 14207-3199
Attention: NCBCO-S
716/876-5454 x2313
*Joint application with
New York*

CHARLESTON

P.O. Box 919
Charleston, SC
29402-0919
Attention: SACCO-P
803/724-4330

CHICAGO

219 S. Dearborn Street
Chicago, IL 60604-1797
Attention: NCCCO-R
312/353-6428
*Joint application with
Illinois*

DETROIT

P.O. Box 1027
Detroit, MI 48231-1027
Attention: NCECO-L
313/226-2218
*Joint application with
Michigan*

FT. WORTH

P.O. Box 17300
Ft. Worth, TX 76102-0300
Attention: SWFOD-O
817/334-2681

GALVESTON

P.O. Box 1229
Galveston, TX 77553-1229
Attention: SWGCO-R
409/766-3925

HUNTINGTON

502 8th Street
Huntington, WV 25701-2070
Attention: ORHOP-F
304/529-5487
*Joint application with
West Virginia*

HONOLULU

Building 230, Fort Shafter
Honolulu, HI 96858-5440
Attention: PODCO-O
808/438-9258

JACKSONVILLE

P.O. Box 4970
Jacksonville, FL 32232-0019
Attention: SAJRD
904/791-1659
*Joint application with
Florida, Virgin Islands*

KANSAS CITY

700 Federal Building
601 E. 12th Street
Kansas City, MO 64106-2896
Attention: MRKOD-P
816/374-3645

LITTLE ROCK

P.O. Box 867
Little Rock, AR
72203-0867
Attention: SWLCO-P
501/378-5295

LOS ANGELES

P.O. Box 2711
Los Angeles, CA 90053-2325
Attention: SPLCO-R
213/688-5606

LOUISVILLE

P.O. Box 59
Louisville, KY 40201-0059
Attention: ORLOP-F
502/582-5452

*Joint application with
Illinois*

MEMPHIS

Clifford Davis Federal
Building
Room B-202
Memphis, TN 38103-1894
Attention: LMMCO-G
901/521-3471

*Joint application with
Missouri, Tennessee,
Kentucky*

MOBILE

P.O. Box 2288
Mobile, AL 36628-00001
Attention: SAMOP-S
205/690-2658

*Joint application with
Mississippi*

NASHVILLE

P.O. Box 1070
Nashville, TN 37202-1070
Attention: ORNOR-F
615/251-5181
*Joint application with TVA,
Tennessee, Alabama*

APPLICATION FOR PERMIT

Read Instructions on back before completing this application. Please type or print clearly in ink. Use separate addenda and exhibits to provide all data and explanations for which space on this form is inadequate.

- ☐ ARTICLE 15, TITLE 3 (CONTROL OF AQUATIC INSECTS, WEEDS, OR UNDESIRABLE FISH)
☐ ARTICLE 15, TITLE 5 (PROTECTION OF WATERS)
☐ For the construction, reconstruction, or repair of a DAM or other impoundment structure.
☐ For the disturbance of a STREAM BED or excavation in or fill of navigable waters.
☐ ARTICLE 15, TITLE 15 ☐ WATER SUPPLY ☐ LONG ISLAND WELL
☐ ARTICLE 24 (FRESHWATER WETLANDS) ☐ Permit ☐ Letter of Permission
☐ ARTICLE 25 (Tidal Wetlands)

1. NAME OF APPLICANT:

2. APPLICANT IS A/AN ☐ Individual ☐ Partnership ☐ Association ☐ Corporation ☐ Municipality ☐ Governmental Agency

3. NAME AND TITLE OF OFFICIAL SIGNING APPLICATION

PHONE

STREET ADDRESS/POST OFFICE

POST OFFICE

STATE

ZIP CODE

4. NAME AND ADDRESS OF OWNER (If not applicant)

PHONE

STREET ADDRESS/POST OFFICE

POST OFFICE

STATE

ZIP CODE

5. PROJECT LOCATION

a) City or Village

Town

County

NAME OF STREAM OR OTHER WATER BODY:

If appropriate: if un-named, show on map—See Item 5b)

6. WILL PROJECT UTILIZE STATE-OWNED LAND?

☐ Yes ☐ No

b) Specific project site or area is marked on U.S.G.S. or equivalent map, attached as Exhibit Number _____

7. PROPOSED USE:

☐ Public ☐ Private ☐ Commercial

8. PROPOSED STARTING DATE:

9. APPROXIMATE COMPLETION DATE:

10. FEE OF

\$ _____ Enclosed

11. PROJECT DESCRIPTION:

Feet of rip-rap new channel; cubic yards of material to be removed; draining, dredging, filling, and location of disposal sites; type or structure to be installed; height of dam; size of impoundment; capacities of proposed water sources; extent of distribution system; etc.

12. THIS PROJECT WILL REQUIRE ADDITIONAL PERMITS, APPLICATIONS FOR WHICH ARE THE RESPONSIBILITY OF OTHERS.

☐ Dam ☐ Excavation/Fill ☐ Stream Disturbance ☐ SPDES/NPDES ☐ Water Supply ☐ L.I. Wells ☐ Freshwater Wetland ☐ Tidal Wetlands

13. NAME AND ADDRESS OF OFFICIAL NEWSPAPER OF LOCALITY WHERE PROPOSED WORKS ARE LOCATED:

14. IS ANY PORTION OF THE ACTIVITY FOR WHICH A PERMIT IS SOUGHT NOW BEGUN OR COMPLETED?

☐ Yes ☐ No If YES, explain in addenda, giving reasons and dates, and show existing work on drawings or map.

15. CERTIFICATION

I hereby affirm that under penalty of perjury that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. As a condition to the issuance of a permit, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project.

APPENDIX A
EAF
ENVIRONMENTAL ASSESSMENT - PART I

Project Information

NOTICE: This document is designed to assist in determining whether the action proposed may have a significant effect on the environment. Please complete the entire Data Sheet. Answers to these questions will be considered as part of the application for approval and may be subject to further verification and public review. Provide any additional information you believe will be needed to complete PARTS 2 and 3.

It is expected that completion of the EAF will be dependent on information currently available and will not involve new studies, research or investigation. If information requiring such additional work is unavailable, so indicate and specify each instance.

NAME OF PROJECT:

NAME AND ADDRESS OF OWNER (If Different)

(Name)

ADDRESS AND NAME OF APPLICANT:

(Street)

(Name)

(P.O.) (State) (Zip)

(Street)

BUSINESS PHONE: _____

(P.O.) (State) (Zip)

DESCRIPTION OF PROJECT: (Briefly describe type of project or action) _____

(PLEASE COMPLETE EACH QUESTION - Indicate N.A. if not applicable)

A. SITE DESCRIPTION

(Physical setting of overall project, both developed and undeveloped areas)

1. General character of the land: Generally uniform slope _____ Generally uneven and rolling or irregular _____
2. Present land use: Urban _____, Industrial _____, Commercial _____, Suburban _____, Rural _____, Forest _____, Agriculture _____, Other _____
3. Total acreage of project area: _____ acres.

Approximate acreage:	Presently After Completion			Presently After Completion	
Meadow or Brushland	_____ acres	_____ acres	Water Surface Area	_____ acres	_____ acres
Forested	_____ acres	_____ acres	Unvegetated (rock, earth or fill)	_____ acres	_____ acres
Agricultural	_____ acres	_____ acres	Roads, buildings and other paved surfaces	_____ acres	_____ acres
Wetland (Freshwater or Tidal as per Articles 24, 25 or F.C.L.)	_____ acres	_____ acres	Other (indicate type)	_____ acres	_____ acres

4. What is predominant soil type(s) on project site? _____
5. Are there bedrock outcroppings on project site? _____ Yes _____ No
6. What is depth to bedrock? _____ (in feet)

6. Approximate percentage of proposed project site with slopes: 0-10% ____%; 10-15% ____%; 15% or greater ____%.
7. Is project contiguous to, or contain a building or site listed on the National Register of Historic Places? ____ Yes ____ No
8. What is the depth to the water table? ____ feet
9. Do hunting or fishing opportunities presently exist in the project area? ____ Yes ____ No
10. Does project site contain any species of plant or animal life that is identified as threatened or endangered - ____ Yes ____ No, according to - Identify each species _____
-
11. Are there any unique or unusual land forms on the project site? (i.e. cliffs, dunes, other geological formations - ____ Yes ____ No. (Describe _____)
12. Is the project site presently used by the community or neighborhood as an open space or recreation area - ____ Yes ____ No. private businesses
13. Does the present site offer or include scenic views or vistas known to be important to the community? ____ Yes ____ No
14. Streams within or contiguous to project area:
- a. Name of stream and name of river to which it is tributary _____
-
15. Lakes, Ponds, Wetland areas within or contiguous to project area: (none)
- a. Name _____; b. Size (in acres) _____
16. What is the dominant land use and zoning classification within a 1/4 mile radius of the project (e.g. single family residential, R-2) and the scale of development (e.g. 2 story).

PROJECT DESCRIPTION

1. Physical dimensions and scale of project (fill in dimensions as appropriate)
- a. Total contiguous acreage owned by project sponsor _____ acres.
Project acreage developed: ____ acres initially; ____ acres ultimately.
- c. Project acreage to remain undeveloped _____.
Length of project, in miles: _____ (if appropriate)
- e. If project is an expansion of existing, indicate percent of expansion proposed: building square footage ____; developed acreage _____.
2. Number of off-street parking spaces existing ____; proposed _____.
3. Maximum vehicular trips generated per hour _____ (upon completion of project)
- If residential: Number and type of housing units:
- | | One Family | Two Family | Multiple Family | Condominium |
|----------|------------|------------|-----------------|-------------|
| Initial | _____ | _____ | _____ | _____ |
| Ultimate | _____ | _____ | _____ | _____ |
- If _____
- | | Orientation
highroad (city, regional) | Estimated Employment |
|------------|--|----------------------|
| Commercial | _____ | _____ |
| Industrial | _____ | _____ |
4. Total height of tallest proposed structure ____ feet (roof elevation) - sea -level)

- 2.* How much natural material (i.e. rock, earth, etc.) will be removed from the site - _____ tons
_____, cubic y
3. How many acres of vegetation (trees, shrubs, ground covers) will be removed from site - _____ acres.
4. Will any mature forest (over 100 years old) or other locally-important vegetation be removed by this project? _____ Yes _____ No
5. Are there any plans for re-vegetation to replace that removed during construction? _____ Yes _____ No
6. If single phase project: Anticipated period of construction _____ months, (including demolition).
7. If multi-phased project: a. Total number of phases anticipated _____ No.
b. Anticipated date of commencement phase 1 _____ month _____ year (including demolition)
c. Approximate completion date final phase _____ month _____ year.
d. Is phase 1 financially dependent on subsequent phases? _____ Yes _____ No
8. Will blasting occur during construction? _____ Yes _____ No
9. Number of jobs generated: during construction _____; after project is complete _____.
10. Number of jobs eliminated by this project _____.
11. Will project require relocation of any projects or facilities? _____ Yes _____ No. If yes, explain:

12. a. Is surface or subsurface liquid waste disposal involved? _____ Yes _____ No.
b. If yes, indicate type of waste (sewage, industrial, etc.) _____
c. If surface disposal name of stream into which effluent will be discharged _____
13. Will surface area of existing lakes, ponds, streams, bays or other surface waterways be increased or decreased by proposal? _____ Yes _____ No.
14. Is project or any portion of project located in the 100 year flood plain? _____ Yes _____ No
15. a. Does project involve disposal of solid waste? _____ Yes _____ No
b. If yes, will an existing solid waste disposal facility be used? _____ Yes _____ No
c. If yes, give name: _____; location _____
d. Will any wastes not go into a sewage disposal system or into a sanitary landfill? _____ Yes _____ No
16. Will project use herbicides or pesticides? _____ Yes _____ No
17. Will project routinely produce odors (more than one hour per day)? _____ Yes _____ No
18. Will project produce operating noise exceeding the local ambience noise levels? _____ Yes _____ No
19. Will project result in an increase in energy use? _____ Yes _____ No. If yes, indicate type(s) _____

20. If water supply is from wells indicate pumping capacity _____ gals/minute.
21. Total anticipated water usage per day _____ gals/day.
22. Zoning: a. What is dominant zoning classification of site? _____
b. Current specific zoning classification of site _____
c. Is proposed use consistent with present zoning? _____
d. If no, indicate desired zoning _____

16. Approvals: *a. Is any Federal permit required? Yes No

b. Does project involve State or Federal funding or financing? Yes No

c. Local and Regional approvals:

	Approval Required (Yes, No)	(Type)	Submittal (Date)	Approval (Date)
City, Town, Village Board				
City, Town, Village Planning Board				
City, Town, Zoning Board				
City, County Health Department				
Other local agencies				
Other regional agencies -				
State Agencies N.Y.DEC				
Federal Agencies Army COE				

C. INFORMATIONAL DETAILS

Attach any additional information as may be needed to clarify your project. If there are or may be any adverse impacts associated with the proposal, please discuss such impacts and the measures which can be taken to mitigate or avoid them.

PREPARER'S SIGNATURE: _____

TITLE: _____

REPRESENTING: _____

DATE: _____

* Procedures to file application for Army Corps of Engineers permits for construction in waterway (Section 10) and dredging/dredge material disposal (Section 404) have commenced. Additionally, procedures to file application to the State of New York have also been started. The following permits, agencies and contacts are relevant:

<u>AGENCY</u>	<u>PERMIT</u>	<u>CONTACT</u>
U.S. Army Corps of Engineers	Section 10 and 404 for dredging & water- front construction	Eric Alysmeier (202) 264-0183
N.Y. Department of Environ- mental Conservation	State dredging permit	Alec Ciesluk (914) 255-5453
N.Y. Department of State	Federal Consistency Assessment Form (Coastal Zone Management)	Charles McCaffrey (518)474-36

- Any construction on slopes of 15% or greater, (15 foot rise per 100 foot of length), or where the general slopes in the project area exceed 10%.
- Construction on Land where the depth to the water table is less than 3 feet.
- Construction of paved parking area for 1,000 or more vehicles.
- Construction on land where bedrock is exposed or generally within 3 feet of existing ground surface.
- Construction that will continue for more than 1 year or involve more than one phase or stage.
- Excavation for mining purposes that would remove more than 1,000 tons of natural material (i.e. rock or soil) per year.

	1. SMALL TO MODERATE IMPACT	2. POTENTIAL LARGE IMPACT	3. CAN IMPACT BE REDUCED BY PROJECT CHANGE
Construction in a designated floodway.	—	—	—
Other impacts: _____	—	—	—
_____	—	—	—
4. WILL THERE BE AN EFFECT TO ANY UNIQUE OR UNUSUAL LAND FORMS FOUND ON THE SITE? (i.e. cliffs, dunes, geological forma- tions, etc.) <input type="radio"/> NO <input type="radio"/> YES	—	—	—
Specific land forms: _____	—	—	—
_____	—	—	—
<u>IMPACT ON WATER</u>			
WILL PROJECT AFFECT ANY WATER BODY DESIGNATED AS PROTECTED? (Under Articles 15, 24, 25 of the Envir- onmental Conservation Law, E.C.L.) <input type="radio"/> NO <input type="radio"/> YES	—	—	—
<u>Examples that Would Apply to Column 2</u>			
Dredging more than 100 cubic yards of material from channel of a protected stream.	—	—	—
Construction in a designated freshwater or tidal wetland.	—	—	—
Other impacts: _____	—	—	—
_____	—	—	—
WILL PROJECT AFFECT ANY NON-PROTECTED EXISTING OR NEW BODY OF WATER? <input type="radio"/> NO <input type="radio"/> YES	—	—	—
<u>Examples that Would Apply to Column 2</u>			
A 10% increase or decrease in the surface area of any body of water or more than a 10 acre increase or decrease.	—	—	—
Construction of a body of water that exceeds 10 acres of surface area.	—	—	—
Other impacts: _____	—	—	—
_____	—	—	—
5. WILL PROJECT AFFECT SURFACE OR GROUNDWATER QUALITY? <input type="radio"/> NO <input type="radio"/> YES	—	—	—
<u>Examples that Would Apply to Column 2</u>			
Project will require a discharge permit.	—	—	—
Project requires use of a source of water that does not have approval to serve proposed project.	—	—	—
Project requires water supply from wells with greater than 45 gallons per minute pumping capacity.	—	—	—
Construction or operation causing any contamination of a public water supply system.	—	—	—
Project will adversely affect groundwater.	—	—	—
Liquid effluent will be conveyed off the site to facilities which presently do not exist or have inadequate capacity.	—	—	—
Project requiring a facility that would use water in excess of 20,000 gallons per day.	—	—	—
Project will likely cause siltation or other discharge into an existing body of water to the extent that there will be an obvious visual contrast to natural conditions.	—	—	—

	1. SMALL TO MODERATE IMPACT	2. POTENTIAL LARGE IMPACT	3. CAN IMPACT BE REDUCED BY PROJECT CHANGE
Other Impacts: _____	—	—	—
6. WILL PROJECT ALTER DRAINAGE FLOW, PATTERNS OR SURFACE WATER TO RUNOFF? <input type="radio"/> NO <input checked="" type="radio"/> YES	—	—	—
Example that Would Apply to Column 2			
Project would impede flood water flows.	—	—	—
Project is likely to cause substantial erosion.	—	—	—
Project is incompatible with existing drainage patterns.	—	—	—
Other impacts: _____	—	—	—
<u>IMPACT ON AIR</u>			
7. WILL PROJECT AFFECT AIR QUALITY? <input type="radio"/> NO <input checked="" type="radio"/> YES	—	—	—
Examples that Would Apply to Column 2			
Project will induce 1,000 or more vehicle trips in any given hour.	—	—	—
Project will result in the incineration of more than 1 ton of refuse per hour.	—	—	—
Project emission rate of all contaminants will exceed 5 lbs. per hour or a heat source producing more than 10 million BTU's per hour.	—	—	—
Other impacts: _____	—	—	—
<u>IMPACT ON PLANTS AND ANIMALS</u>			
8. WILL PROJECT AFFECT ANY THREATENED OR ENDANGERED SPECIES? <input type="radio"/> NO <input checked="" type="radio"/> YES	—	—	—
Examples that Would Apply to Column 2			
Reduction of one or more species listed on the New York or Federal list, using the site, over or near site or found on the site.	—	—	—
Removal of any portion of a critical or significant wildlife habitat.	—	—	—
Application of Pesticide or herbicide over more than twice a year other than for agricultural purposes.	—	—	—
Other impacts: _____	—	—	—
9. WILL PROJECT SUBSTANTIALLY AFFECT NON-THREATENED OR ENDANGERED SPECIES? <input type="radio"/> NO <input checked="" type="radio"/> YES	—	—	—
Example that Would Apply to Column 2			
Project would substantially interfere with any resident or migratory fish or wildlife species.	—	—	—
Project requires the removal of more than 10 acres of mature forest (over 100 years in age) or other locally important vegetation.	—	—	—

	1. SMALL TO MODERATE IMPACT	2. POTENTIAL LARGE IMPACT	3. CAN IMPACT BE REDUCED BY PROJECT CHANGE
<u>IMPACT ON VISUAL RESOURCE</u>			
10. WILL THE PROJECT AFFECT VIEWS, VISTAS OR THE VISUAL CHARACTER OF THE NEIGHBORHOOD OR COMMUNITY?			
NO YES			
<u>Examples that Would Apply to Column 2</u>			
— An incompatible visual affect caused by the introduction of new materials, colors and/or forms in contrast to the surrounding landscape.	—	—	—
— A project easily visible, not easily screened, that is obviously different from others around it.	—	—	—
— Project will result in the elimination or major screening of scenic views or vistas known to be important to the area.	—	—	—
— Other impacts: _____	—	—	—
— _____	—	—	—
<u>IMPACT ON HISTORIC RESOURCES</u>			
11. WILL PROJECT IMPACT ANY SITE OR STRUCTURE OF HISTORIC, PRE-HISTORIC OR PALEONTOLOGICAL IMPORTANCE?			
NO YES			
<u>Examples that Would Apply to Column 2</u>			
— Project occurring wholly or partially within or contiguous to any facility or site listed on the National Register of historic places.	—	—	—
— Any impact to an archeological site or fossil bed located within the project site.	—	—	—
— Other impacts: _____	—	—	—
— _____	—	—	—
<u>IMPACT ON OPEN SPACE & RECREATION</u>			
12. WILL THE PROJECT AFFECT THE QUANTITY OR QUALITY OF EXISTING OR FUTURE OPEN SPACES OR RECREATIONAL OPPORTUNITIES?			
NO YES			
<u>Examples that Would Apply to Column 2</u>			
— The permanent foreclosure of a future recreational opportunity.	—	—	—
— A major reduction of an open space important to the community.	—	—	—
— Other impacts: <u>Positive - Will expand private recreational opportunities</u>	—	—	—
— _____	—	—	—
<u>IMPACT ON TRANSPORTATION</u>			
13. WILL THERE BE AN EFFECT TO EXISTING TRANSPORTATION SYSTEMS?			
NO YES			
<u>Examples that Would Apply to Column 2</u>			
— Alteration of present patterns of movement of people and/or goods.	—	—	—
— Project will result in severe traffic problems.	—	—	—
— Other impacts: _____	—	—	—
— _____	—	—	—

SMALL TO MODERATE IMPACT	POTENTIAL LARGE IMPACT	REDUCED BY PROJECT CHANGE
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	accommodati
—	—	changes alr
—	—	made (see a

accommodating
changes already
made (see attached
Part II)

PORTIONS OF EAF COMPLETED FOR THIS PROJECT:

PART I _____ PART II _____ PART 3 _____

Upon review of the information recorded on this EAF (Parts 1, 2 and 3) and considering both the magnitude and importance of each impact, it is reasonably determined that:

- A. The project will result in no major impacts and, therefore, is one which may not cause significant damage to the environment.
- B. Although the project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described in PART 3 have been included as part of the proposed project.
- C. The project will result in one or more major adverse impacts that cannot be reduced and may cause significant damage to the environment.

PREPARE A NEGATIVE DECLARATION

PREPARE A NEGATIVE DECLARATION

PREPARE POSITIVE DECLARATION PROCEED WITH EIS

Signature of Preparer (if different from responsible officer)

Print & type name of responsible official
in Lead Agency

APPENDIX G
ENGINEERING STANDARDS

RECOMMENDED MINIMUM SINGLE POINT MOORING TACKLE SPECIFICATIONS

Utilization of proper mooring tackle is necessary to secure vessels adequately at their moorings. Storms, wind, waves, tides, currents and wash must be considered when selecting appropriate hardware. Therefore, the harbor management commission recommends minimum standards for tackle to secure vessels adequately. These standards are advisory only, and the Town assumes no liability for personal injury or property damage which results from the utilization of any tackle which meets or exceeds these recommendations.

1. Mooring tackle should meet the following minimum standards:

Registered Boat Length (Feet)	Mushroom Anchor (Pounds)	Bottom Chain (Inches)	Top Chain (Inches)	Nylon or Dacron Line (Inches)	Stainless Steel Wire (Inches)
Under 16	75	3/8	5/16	1/2	1/4
16-19	150	3/8	5/16	1/2	1/4
20-22	200	1/2	5/16	5/8	1/4
23-25	250	1/2	5/16	3/4	1/4
26-30	300	5/8	3/8	3/4	1/4
31-35	400	5/8	3/8	3/4	1/4
36-40	500	3/4	1/2	7/8	3/8
4-150	600	3/4	1/2	1	1/2
51-65	750	1	1/2	1-1/4	1/2

2. The maximum length of the pennant should be two and one-half times the distance from the bow chock to the water plus the distance from the bow chock to the mooring cleat or post.
3. All pennant lines running through a chock or any other object where chafing may occur should have adequate chafe guards.
4. The total scope of the chain should be two and one-half times the depth of the water at high tide. The bottom and top chain should each consist of approximately 50 percent of the scope.
5. All shackles, swivels and other hardware used in the mooring hookup should be proportional in size to the chain used.
6. All shackles should be properly seized.
7. It is recommended that the pennant be spliced or shackled into the bitter end of the top chain below the buoy so the strain is not carried by the buoy. The use of a second pennant and anchor in heavy weather is encouraged.

8. Only mushroom anchors will be acceptable on permanent moorings.
9. In non-grid areas, the minimum distance between any two moored vessels should be 1.25 times the total mooring scope plus the length of the larger vessel.

NFPA 303

Marinas and Boatyards

1984



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Fire Protection Standard for Marinas and Boatyards

NFPA 303-1984

1984 Edition of NFPA 303

This edition of NFPA 303, *Fire Prevention Standard for Marinas and Boatyards*, was prepared by the Technical Committee on Marinas and Boatyards, released by the Correlating Committee on Marine Fire Protection, and acted on by the National Fire Protection Association, Inc. at its Fall Meeting held November 14-17, 1983 in Orlando, Florida. It was issued by the Standards Council on December 8, 1983 with an effective date of December 28, 1983, and supersedes all previous editions.

This 1984 edition of this standard has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the page on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

Origin and Development of NFPA 303

This first NFPA standard on the subject of marinas and boatyards was adopted by the Association in 1940 on recommendation of the Committee on Boat Basins and Municipal Marinas of the then NFPA Marine Section. The following year the scope of the recommendations was enlarged to include boat service and storage yards. Minor amendments were adopted in 1952 and 1957. A revised edition was produced in 1960 by the Committee on Motor Craft and Marinas. In 1961, the Sectional Committee on Marinas and Boatyards was established to deal exclusively with these matters. A complete revision of NFPA 303 was developed and adopted in 1963, amendments to which were adopted in 1966, 1969, and 1975.

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considerably for individual boat servicing establishments. Factors which influence the type and extinguishing power of fire fighting equipment selected include:

- (a) Life and property values at risk.
- (b) Class, rapidity of spread, and intensity of fire anticipated.
- (c) Accessibility of area to be protected.
- (d) Temperature to which fire equipment may be exposed.
- (e) Time interval between transmission of alarm and arrival of public fire department.

2-2.2 Division of Plant into Fire Protection Areas.

2-2.2.1 Marinas and boatyards often present an extreme variation in the types and degrees of fire hazards associated with their diversified operations. Where such diversities exist, a full property layout plan can assist in determining the fire protection required by the various separated working areas. Examples of areas to be differentiated in the layout are:

- (a) Area, type of construction, usage, subdivision and spacing of all buildings.
- (b) Entries, internal roadways, and passages.
- (c) Outside boat storage areas.
- (d) Marine railways and lifts.
- (e) Docks and piers.
- (f) Fueling facilities including fuel storage.
- (g) Adjacent premises and their occupancies.

2-2.2.2 Consideration of the fire potential existing in adjacent premises is essential in measuring the degree of exposure from fire originating within those premises. Such exposures could materially influence the type and quantity of fire protection necessary as well as the degree of fire protection education and training required for yard employees.

2-2.3* Fixed Fire Extinguishing Equipment. Both automatic and hand operated devices of approved types are available which, when properly installed, maintained and handled, will provide means for controlling and extinguishing incipient fires. Among these are the following:

(a) *Automatic Sprinklers.* These are considered the most important of all fire protective devices when correctly installed, with an abundant and constant water supply at proper pressure, and maintained so as to be operative at all times. Sprinkler systems have been found very reliable and satisfactory for use in practically all types of structures and under nearly all conditions of fire hazards. Wet- or dry-pipe systems are available, and where subject to temperatures below freezing even for short periods, the dry-pipe system is essential. Installation of sprinkler systems is normally done by reliable, specialized contractors in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*. Regular inspection and maintenance of systems at reasonable intervals is necessary.

(b) *Standpipe and Hose Systems.* These systems provide a quick means of applying an effective quenching

stream on incipient fires and also can be used to control more advanced fires or to prevent their spread. Installations of such systems shall be in accordance with NFPA 14, *Standpipe and Hose Systems*.

(i) A systematic and regular check of all parts of a standpipe system is essential for the maintenance of the system in an instantly operative condition.

(c)* *Underground Fire Lines with Hydrants.* For establishments encompassing considerable area, and having berthing facilities, underground fire line systems with hydrants are highly recommended. Such systems shall be connected to the public water supply, if available, and this connection shall be independent of other public water service lines within the premises. If a public water supply connection is not available or feasible, an underground fire line shall be supplied by an approved fire pump of not less than 500-gpm (.0315 m³/s) capacity, depending upon the extent of the premises. It is preferable that fire pumps take suction from a fresh water supply but, if necessary, salt water may be used.

(i) In laying out a fire line system, the piping shall be run to serve all buildings, piers, repair docks, outside boat storage areas, and areas used to store combustibles such as lumber. Hydrants shall be so located as to keep hose lines as short as practicable, preferably not over 250 ft (76.2 m). The guiding requirement shall be the ability to apply two effective streams to every exterior part of the area serviced by the hose normally attached to the hydrant. Hydrants shall be located in relation to buildings so as to be accessible and usable under any anticipated conditions of fire.

(ii) Underground piping shall be laid with due regard to climatic and seasonal conditions. During the winter season the system may require complete draining with water supply instantly available through control of a main valve located in a heated area, which may also house the pump if the system is privately charged. Such an area shall be accessible and useful under any fire conditions within the premises. Underground piping shall be not less than 6 in. (.15 m) in diameter and hydrants should conform to the National Standard.

(iii) Approved 1½-in. (.038-m) hose in 75-ft (22.9-m) lengths shall be provided and properly housed in hose houses equipped with play pipes, ordinary nozzles and fog nozzles, hydrant wrenches and spanners. Such equipment shall be located at strategic points, for instance, where piers exceed 250 ft (76.2 m), each shall be provided with a 2-in. (.05-m) water line extending the length of the pier and be equipped with 1½-in. (.038-m) hose connections at 75-ft (22.9-m) intervals. At shore ends these water lines shall be equipped with 2½-in. (.064-m) hose adapters to permit connection to a fire hydrant outlet of the same size. The pier water lines shall be normally dry where freezing temperatures occur.

2-2.4 Portable Fire Extinguishing Equipment.

2-2.4.1 Portable fire extinguishing equipment is frequently referred to as first-aid fire fighting equipment because its successful use depends upon prompt application to incipient fires. It is essential that boat servicing establishments be well armed with the proper first-aid fire fighting equipment. Only extinguishers listed by Underwriters Laboratories or approved by the Factory

(e) Fire protection equipment.

2-3.3 Transmission of Fire Alarm. The alarm shall be transmitted to the fire department immediately upon discovery of any fire. This shall be a duty impressed upon all personnel and especially upon watch personnel. Means for sounding an alarm of fire for notification of yard personnel and others on the premises shall be provided.

2-3.4 Maintenance of Access. All entries and internal passageways shall be maintained free of obstructions at all times. Fire protection equipment, either private or public, shall not be obstructed. Fencing shall be arranged to permit prompt access to fire fighting forces and apparatus in an emergency.

Chapter 3 Berthing and Storage Facilities

3-1 Design. Due to the many various configurations of land and water areas where marinas and boatyards are located, it is not practical to specify any details of layout. Each design, however, shall provide the following features:

(a) Each mooring or wharfage berth shall be arranged so that a boat occupying the berth can be readily removed in an emergency without the necessity of moving another boat.

(b) Mooring and wharfage areas shall be arranged to permit boats to enter or leave their berths with a minimum amount of maneuvering.

(c) Access from land to piers and floats shall permit municipal or other fire fighting equipment to be located where hose lines may be extended to the full length of the pier or floats.

(d) Water lines for instant use in fire fighting shall be permanently installed accessible to all berthing piers and floats. They shall be protected from freezing where necessary. These water lines shall be connected to an adequate water supply ashore or to motor driven pumps capable of providing adequate water. The water line layout shall be approved by the authority having jurisdiction.

(e) An electrical lighting system shall be provided to assure adequate illumination of all exterior shore areas, piers, and/or floats. The wiring, fixtures, and fittings shall be provided and installed in accordance with Chapter 5 of this standard.

(f) If an auxiliary power supply, arranged to provide lighting for pier and dock areas is not provided, an approved battery-powered emergency lighting fixture conforming to the requirements of Section 700-16, *National Electrical Code*[®], and protected from the weather shall be installed at the outboard end and the shore end of each pier.

3-2 Dry Storage of Boats.

3-2.1 In addition to compliance with other sections of this standard, dry storage areas require additional protection due to the greater degree of congestion and the decreased inspection frequency of each vessel.

3-2.2 Separation of Areas. When work is carried out on board a vessel in an unsprinklered storage building, an approved fire detection device shall be maintained within the vessel for the duration of repairs; and the vessel shall be included on the watch person's regular rounds.

3-2.3 Suitable lockers or facilities shall be provided for boat gear, with great care exercised to see that no items subject to spontaneous heating are included, such as oilskin clothing, etc.

3-2.4 The use of heaters in a boat storage area shall be prohibited except when necessary to accomplish repairs, in which case they shall be regularly attended.

3-2.5 No flammable liquids or materials shall be kept in boat storage areas.

3-2.6 Fixed or portable ladders of sufficient length to reach every stored boat shall be so located as to be readily available for use.

3-2.7 When a boat is to be dry stored for the season, the following precautions shall be taken in addition to normal winter lay-up preparations:

(a) The entire vessel shall be inspected for any hazardous materials or conditions that may be present.

(b) All loose combustibles shall be removed and stored in suitable lockers or segregated safe areas.

(c) Liquefied petroleum gas cylinders, alcohol or kerosene from galley fuel tanks, and any reserve fuel supplies for the galley shall be removed and stored in a safe area.

(d) Batteries of the lead-acid type shall be removed for storage and recharging whenever practicable. When, for reasons of size and weight, it is impractical to remove batteries for storage and recharging, they may be permitted to remain on board provided:

(i) The compartment in which the batteries are located is arranged to provide adequate ventilation to prevent entrapment of released gases;

(ii) An approved type battery charger is permanently installed on the boat, so arranged as to provide a suitable trickle charge;

(iii) The power connection to the trickle charger consists of a three-wire circuit of not less than No. 12 AWG conductors, connected to a source of 110 to 125 volts single phase, with a control switch and approved circuit protection device arranged to trip at not more than 125 percent of the rated amperage of the charger;

(iv) There is no connection on the load side of the circuit protection device from this circuit to any other device;

(v) The electrical wiring complies with all of the requirements of this standard, and the *National Electrical Code*, and

(vi) The battery is permanently connected to the outlet terminals of the charger and the grounding conductor effectively grounds the charger enclosure.

Chimneys, Fireplaces and Vents. Chimney connectors shall not pass through concealed spaces.

(d) Ready fuel supplies, particularly if scrap wood is used, shall be neatly stowed to maintain safe clearance from stoves.

(e) Substantial metal cans shall be provided for handling ashes. These cans shall not be used as receptacles for combustible waste.

4-2.6 Heating devices employing a flame or exposed hot wires shall not be used in areas where flammable vapors or combustible dusts may be present.

4-3 Storage and Handling of Fuels.

4-3.1* The fueling station shall be located to minimize the exposure of all other plant facilities. Where tide and weather exposure conditions permit, all fuel handling shall be outside the main berthing area.

4-3.2 All boat fueling operations shall be carefully accomplished in accordance with NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*, at the fueling station or other specifically designated remote location.

4-3.3 Inside fueling stations shall be located near an exit by water from the berthing area or at some other location from which, in case of fire aboard a boat alongside, the stricken craft may be quickly removed without endangering other boats nearby.

4-3.4 No tank barge or other fuel supply boat shall be permitted within the berthing area. Outside berths and connections shall be provided for the use of tank barges or fuel supply boats when filling storage tanks.

4-3.5 Fuel storage tanks shall be installed in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, and in accordance with all state and local ordinances.

4-3.6 Fuel storage tanks shall be securely anchored where they are located subject to flooding or tidal conditions, and the applicable precautions outlined in Chapter 2 of NFPA 30, *Flammable and Combustible Liquids Code*, shall be observed.

4-3.7 Fuel storage tanks and pumps, other than those integral with approved dispensing units, supplying gasoline, Class I, or Class II flammable liquids at marine service stations, shall be located only on shore, or with the express permission of the authority having jurisdiction on a pier of solid-fill type. Approved dispensing units with or without integral pumps may be located on shore, piers of solid-fill type, or open piers, wharves or floating piers.

4-3.8 Tanks and pumps supplying diesel Class III flammable liquids at marine service stations may be located on shore, on piers of solid-fill type or on open piers, wharves or floating piers. Class III flammable liquid tanks which are located elsewhere than on shore or on piers of the solid-fill type shall be limited to 550 gal (2.08 m³) aggregate capacity. Pumps not a part of the dispensing unit shall be located adjacent to the tanks.

4-3.9 Fuel pipelines shall be installed in accordance with the provisions of NFPA 30, *Flammable and Combustible Liquids Code*.

4-3.10 Dispensing units for transferring fuels from storage tanks shall be in accordance with provisions of NFPA 30, *Flammable and Combustible Liquids Code*. Every fuel delivery nozzle shall be equipped with a self-closing control valve, which will shut off the flow of fuel when the operator's hand is removed from the nozzle. The use of any automatic nozzle with a latch-open device is prohibited. In the construction of the fuel hose assembly, provision shall be made so the fuel delivery nozzle is properly bonded to the shore electric grounding facilities as required in 5-6.3 of this standard. The use of any device to override this safety feature is prohibited.

4-3.11 Gasoline and other flammable liquids stored in drums or cans shall be kept separated from other plant facilities, and stored and dispensed in accordance with applicable requirements of NFPA 30, *Flammable and Combustible Liquids Code*. Fueling operations involving systems using portable tanks shall be in accordance with provisions set forth for outboard boats in NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*.

4-3.12 Hand carriage of gasoline within the plant area shall be restricted to containers designed for carrying and storage of fuel. Open buckets, cans or glass jars shall not be used.

4-3.13 Only soaps, detergents and approved solvents shall be used on the premises or on board boats. Gasoline or Class I flammable liquids shall not be used.

4-4 Storage and Handling of Paints and Spirits. Paint storage and mixing shall be segregated from other working and storage areas preferably by provision of a well-separated and ventilated building of noncombustible construction, but otherwise by provision of a ventilated fire-resistive room with properly protected openings.

4-5 Paint Removal and Painting.

4-5.1 Removal of paint or other finishes by means of a blowtorch or use of flammable solvents shall be restricted to exterior surfaces of boats and shall be conducted only out-of-doors and well separated from other craft.

4-5.2 Only trained yard personnel shall be permitted to perform paint removal by means of a blowtorch.

4-5.3 All fuel tank vents shall be effectively plugged before burning operations are begun and the plugs removed upon completion of the burning operations.

4-5.4 An adequate supply of approved fire extinguishing equipment of suitable type shall be readily accessible to all areas where paint removal, painting or refinishing is in process.

4-5.5 The operation of open flame or spark producing equipment shall not be permitted where painting, sand-

sary in the separating firewall, it shall comply with the requirements of NFPA 80, *Fire Doors and Windows*.

4-9.2 Machines and motors shall be kept clean and in good repair at all times.

4-9.3 All flammable liquids required shall be kept to a minimum and handled only in approved safety cans.

4-9.4 Gravity feed from fuel tanks to test stands shall not be permitted.

4-9.5* An adequate supply of approved portable fire extinguishers of suitable type shall be installed and maintained in an approved manner.

4-10 Battery Service and Storage.

4-10.1 Hydrogen gas is formed during the functioning of wet cell storage batteries. Hydrogen gas is highly flammable, is much lighter than air, and will rise to the highest available space. The area used for service or storage of such batteries shall be designed to:

(a) Vent the gas to exterior atmosphere, and

(b) Prevent ignition of such gas which may not be completely vented.

4-10.2 A separate room or completely closed area shall be provided for battery charging and storage. The room shall be used for no other purpose and materials not required for the designated use shall not be placed or stored therein. The access door and windows (if any) shall be kept locked when the room is unattended.

4-10.3 The battery room shall be ventilated in the following manner: Provide air inlets at, or below, the level of the battery racks with adequate exhausts at ceiling. Install a vent stack equipped with natural draft exhaust head to aid in providing an upward draft.

4-10.4 The room and the electrical equipment located within the described space shall conform to the applicable requirements of the *National Electrical Code*, for Class I, Division 1, Group B, Hazardous Areas.

4-10.5 To minimize the hazard, switches for control of services and illumination may be located on the exterior of the room or enclosure, and, in such location, need not be rated explosionproof.

4-10.6 Battery chargers used shall have separate control switches in addition to a master switch to control all units.

4-10.7 Charging equipment shall be well secured, protected from physical damage and so located as to permit good ventilation all around it. Metal enclosures of battery charging devices shall be bonded to the equipment grounding conductor of the electrical system (green wire).

4-10.8 Racks for storing and charging use shall be substantial, suitably insulated, reasonably open and permit the setting of batteries so that no pockets, in which

gases might accumulate, can be formed, and shall conform to the requirements of Section 480-6, *National Electrical Code*.

4-10.9 Insulated tools and battery clips equipped with rubber cuffs shall be used to avoid short circuits.

4-10.10 All battery servicing work shall be conducted by experienced personnel only. The following specific precautions shall be followed:

(a) Prohibit smoking in the battery room.

(b) No open flame or spark producing work shall be undertaken in the battery room.

(c) No volatile liquids shall be stored or used in the battery room.

(d) Cell caps shall be kept tight while connecting or disconnecting batteries.

(e) Battery tongs or other appropriate carrying devices shall be used when removing or lifting batteries.

(f) Wiring connections shall never be connected or disconnected if power is being supplied to or released by batteries.

(g) When nickel-cadmium batteries are to be charged or serviced in the reserved area, the work shall be done in a separate work area from which servicing or charging is done on lead-acid types of storage batteries. Tools and equipment used in servicing or charging nickel-cadmium batteries shall be distinguished by an appropriate color applied to them and shall be at all times reserved only for such usage.

4-10.11 One (or more) approved dry chemical portable fire extinguisher(s) shall be provided in a readily accessible location within the enclosed area and shall be maintained in an approved manner.

4-11 Servicing Liquefied Petroleum Gas Systems.

4-11.1 Utmost care shall be exercised at all times in the servicing of liquefied petroleum gas systems and equipment.

4-11.2 Changing of cylinders shall be performed in accordance with NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*.

4-11.3* Checks for leaks in liquefied petroleum gas systems shall never be made with flame.

Chapter 5 Electrical Wiring and Equipment

5-1 Hazards arising from the presence of electrical systems and electrical equipment in the marina and boaryard requiring special precautions are:

(a) Wet or continuously damp areas, exposed to rain, wind-driven spray and atmospheric moisture.

iliary power equipment shall be located outside of the structure and shall fully comply with the requirements of this standard related to the storage and handling of flammable liquid fuels.

(b) The requirements for automatic starting of the emergency generator as included in Section 700-12, *National Electrical Code*, may be waived if the starting battery for the prime mover is maintained on a reliable trickle-charge and is tested by actually starting the prime mover at monthly intervals, as required by Section 700-4, *National Electrical Code*.

5-5.8 The transfer switch for use in connecting an auxiliary emergency generator to the selected load circuits shall be a manually operated double throw switch, with wiring arranged to disconnect the selected circuits from the normal power source before the auxiliary source is connected to these circuits, and shall be of proper rating to make and break the full load current for all the selected circuits. The transfer switch shall be mounted on the exterior of the structure containing the auxiliary power generating equipment, within a cast metal enclosure having a gasketed cover and an external operating handle arranged to be locked in either position. Wiring connections to the transfer switch shall be made through full weight rigid metal conduit threaded into the enclosure, which shall be adequately grounded. The transfer switch installation shall otherwise comply with the requirements of the *National Electrical Code* (Section 573-2).

5-6 Grounding.

5-6.1 Effective grounding of all noncurrent-carrying metal parts of the electrical system, and provision of suitable equipment-grounding facilities at all outlets provided for the connection of portable equipment, including outlets provided for the connection of shore power to vessels afloat, are of utmost importance in marinas, boatyards, boat basins and similar establishments. This is due to the exposure of electrical systems and equipment to water, damp or wet earth and to other grounded or partially grounded conductive parts, and the consequent danger to life and possibility of high sparking adjacent to combustible materials.

5-6.2 The means and methods of providing an effective ground to the noncurrent-carrying metal parts of the electrical system, and for equipment and portable appliances connected thereto, shall comply with the requirements of the *National Electrical Code* (Article 250).

5-6.3 In addition to any grounding provided by the conduit system there shall be installed a common grounding conductor of not less than No. 12 AWG, arranged in accordance with the requirements of the *National Electrical Code* (Article 250), properly attached to the interior of all metallic boxes, housings and enclosures and properly connected to the grounding facility of all receptacles. Metal inserts and metal attachments which are externally and internally exposed on nonmetallic boxes and enclosures shall be connected to the common ground. Said grounding conductor shall terminate at the distribution panel ground and shall specifically conform to the

requirements of the *National Electrical Code* (Section 555-7).

5-6.4 The partial or complete burial of a metal enclosure in earth shall not be accepted as a substitute for the grounding requirements as provided herein with respect to such enclosure.

5-6.5 Metal poles, lighting standards and other metal supports which carry or enclose electrical wiring shall be effectively grounded.

5-7 Standard Locations. The entire electrical system installed in a Standard Location shall comply with the requirements of the *National Electrical Code*.

5-8 Damp Locations. The entire electrical system installed in a Damp Location shall be composed of materials approved for the purpose (as defined in Article 100, *National Electrical Code*).

5-9 Wet Locations. The entire electrical system in a Wet Location shall be composed of materials suitable for compliance with the definition of "wet locations" as given in Article 100, *National Electrical Code*.

5-10 Hazardous (Classified) Locations.

5-10.1 The entire electrical system installed in a Hazardous (Classified) Location shall comply with the requirements as given in Article 500, *National Electrical Code*, and, in addition, when required by the conditions, to the requirements of this standard related to Damp and Wet Locations.

5-10.2 Wiring and electrical equipment installed on piers, wharves, docks or similar locations shall specifically conform to the requirements of Article 555, *National Electrical Code*, when located in proximity to gasoline dispensing equipment.

5-11 Wiring Methods and Materials (Damp and Wet Locations).

5-11.1 The wiring method shall be rigid metal conduit or rigid nonmetallic conduit.

Exception No. 1: Where flexibility is required the wiring method shall be other approved types.

Exception No. 2: As permitted by Article 225, National Electrical Code, for outside branch circuits and feeders.

5-11.2 It is recommended that all electrical wiring be installed underground to avoid possible contact with masts and other parts of boats being moved in the yard. Underground electrical installations shall comply with the requirements of Sections 230-30, 230-31, 230-48 and 230-49, *National Electrical Code*.

5-11.3 If electrical wiring is not installed underground, the wiring within yard areas shall be routed to:

(a) Avoid wiring within or across any portion of the yard which may be used for moving vessels.

(b) Avoid wiring closer than 20 ft (6.1 m) from the outer edge or any portion of the yard which may be used for moving vessels or stepping or unstepping masts.

tacle, with not more than one receptacle connected beyond the required circuit breaker. Rigid metallic or nonmetallic conduit shall be installed to protect wiring above the deck of piers and landing stages and below the enclosure which it serves. The conduit shall be connected to the enclosure by full standard threads. The use of special fittings of nonmetallic material to provide a threaded connection into enclosures on rigid nonmetallic conduit, employing joint design as recommended by the conduit manufacturer for attachment of the fitting to the conduit, will be acceptable provided the equipment and method of attachment are approved and the assembly meets the requirements of installation in a Damp Location.

5-14 Receptacles (Damp Locations).

5-14.1 Receptacles shall not be installed in Wet Locations or Hazardous (Classified) Locations.

5-14.2 Receptacles that provide shore power for boats shall be rated not less than 20 amperes and shall be single and of the locking and grounding type conforming to ANSI C75, *Dimensions of Attachment Plugs and Receptacles*.

5-14.3 Each single receptacle that supplies shore power for boats shall be supplied from an outlet or panelboard by an individual branch circuit of the voltage class and rating corresponding to the rating of the receptacle.

5-14.4 Fifteen- and 20-ampere outdoor receptacles, other than those supplying shore power to boats, shall be protected as required by Section 555-3, *National Electrical Code*.

5-14.5 All receptacles shall be installed in enclosures and shall be equipped with an approved means of preventing the entrance of water by rain or splash to the receptacle contacts when the receptacle is not in use.

5-14.6 A special sign, stating the maximum voltage and current (in amperes) available from the shore service connection outlets, shall be permanently located at the shore end of each pier on which electrical outlets for shore service connections are provided, and on a wall visible to all within the office where arrangements are made for berthing facilities. Each such sign shall contain the following additional message in large letters:

"CAUTION: CONNECTION SHALL NOT BE MADE TO ANY SHORE POWER OUTLET WITHOUT PERMISSION OF THE MANAGEMENT."

5-15 Lighting Fixtures.

5-15.1 Lighting fixtures shall conform to the requirements of the *National Electrical Code*, (Sections 410-4, 410-5 and 410-6), and additionally shall be located to prevent damage by contact with stored or moving material.

5-15.2 Lighting fixtures which are located where the light rays are transmitted offshore shall be suitably shielded to comply with the safety regulations of the U. S. Coast Guard.

5-15.3 Switches for control of individual lighting fixtures located where exposed to the weather or splash shall be of a type approved for that location.

5-16 Hazardous (Classified) Locations.

5-16.1 Only qualified persons, as defined in Article 100, *National Electrical Code*, shall be permitted to use, handle, install or repair electrical systems or facilities within any area classed as "Hazardous."

5-16.2 Only the electrical equipment and wiring necessary for the handling and dispensing of the fuels shall be installed within the hazardous area at any outdoor storage or dispensing station. Lighting fixtures for such locations, and the switches controlling them, shall be located beyond the hazardous area unless of a type approved for the location.

5-16.3 The grounding wire of the electrical system, or other approved grounding connection, shall be arranged to provide adequate grounding protection to the metal nozzle of all fuel dispensing equipment.

5-16.4 When electrical equipment is installed in a location which is classified as both Hazardous and Damp, the construction shall include approved methods of meeting the requirements of both locations.

5-17 Tests.

5-17.1 On completion of the electrical system it shall be subjected to an insulation test in the presence of the representative of the authority having jurisdiction. Such tests shall meet the requirements of Section 110-7, *National Electrical Code*.

5-17.2 On all receptacles that are intended to provide shore power to boats, a polarity test shall be made and immediate correction of improper polarity performed in the presence of the inspector. Standard polarity connections are as detailed in Section 200-10, *National Electrical Code*.

5-18 Marine Hoists, Railways, Cranes and Monorails.

5-18.1 Motors and controls for marine hoists and railways shall be located above the possibility of flooding by abnormally high water. Wiring and equipment located in an area described herein as a Damp Location shall conform to the requirements of this standard for such locations.

5-18.2 Where cranes or monorails are installed inside buildings for hoisting or transporting vessels or heavy equipment, the power shall be supplied by a system of enclosed trolley busway of the required ampere rating, located parallel to the crane track or monorail and above the level of possible flooding by abnormally high water. Open wire conductors or cable reels for supplying power to any hoist or motor operated on a crane or monorail shall not be used. The trolley busway system shall be of metal enclosed type, with the enclosure properly grounded as described elsewhere herein and protected by overcurrent devices as required by the *National Electrical Code* (Section 610, Part E). The insulating members of the trolley busway system, including those in the trolleys,

combined watch and alarm boxes, is recommended for the twofold purpose of watchman supervision and transmission of alarm to the public fire department.

A-2-2.6.3 For further information see NFPA 27, *Private Fire Brigades*.

A-3-2.9 The access may be accomplished by either following a minimum of 3-ft (1-m) separation at the gunwale level with a portable ladder for each four boats, or by the installation of a substantial catwalk raised above the deck level and leading to every boat.

A-4-3.1 Fuel suppliers are urged to clearly display a placard cautioning boat operators to observe the following precautions:

Before Fueling

1. Stop all engines and auxiliaries.
2. Shut off all electricity, open flames and heat sources.
3. Check bilges for fuel vapors.
4. Extinguish all smoking materials.

During Fueling

1. Maintain nozzle contact with fill pipe.
2. Wipe up spills immediately.
3. Avoid overfilling.

After Fueling and Before Starting Engine

1. Inspect bilges for leakage or fuel odors.
2. Ventilate until odors are removed.

A-4-7.4(a) The holder of a valid certificate issued by NFPA establishing his qualifications to determine whether repairs and alterations may be undertaken with safety from hazards to flammable vapor-air mixtures.

A-4-7.6. For additional information see NFPA 51B, *Uses of Welding and Cutting Processes*.

A-4-8(f) See NFPA 10, *Installation of Portable Fire Extinguishers*.

A-4-9.5 See NFPA 10, *Installation of Portable Fire Extinguishers*.

A-4-11.3 Use of liquid detergent or soapy water solution is recommended. NEVER USE SOAP CONTAINING AMMONIA. For further information, see NFPA 58, *Standard for the Storage and Handling of Liquefied Petroleum Gases*.

Appendix B Informatory Referenced Publications

This Appendix lists publications which are referenced within this NFPA document for information purposes only and thus is not considered part of the requirements of the document.

NFPA 20-1983, *Standard for the Installation of Centrifugal Fire Pumps*

NFPA 24-1984, *Standard for Private Fire Service Mains and Their Appurtenances*.

NFPA 58-1983, *Standard for the Storage and Handling of Liquefied Petroleum Gases*.

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| 1 Fire Prevention Code | 468 Purged Enclosures | 57 Piers and Wharves | 415 Fueling Ramp Drainage |
| 10 Portable Extinguishers | 467 Class of Class I Haz. Locations for Elec. Inst. | 58A Parking Structures | 416 Airport Terminals |
| 10L Model Enabling Act | 467M Class of Gases, Vapors, Dusts for Elec. Equip. in Haz. (Classified) Locations | 58B Repair Garages | 417 Loading Walkways |
| 11 Foam Ext. Systems | 468 Explosives, Motor Term. | 59A Air Conditioning Syst. | 418 Roof-top Heliports |
| 11A Medium and High Expansion Foam Syst. | 50 Bulk Oxygen Systems | 90B Warm Air Mtg. Air Cond. | 419 Airport Water Systems |
| 11C Mobile Foam Apparatus | 50A Gaseous Hydrogen Syst. | 91 Blower and Exhaust Syst. | 421 Aircraft Interior F. P. |
| 12 Carbon Dioxide Systems | 51 Welding and Cutting | 97M Heating Terminals, Glossary | 422M Aircraft Fire Investigation Manual |
| 12A Halon 1301 Systems | 51A Acetylene Charging Plants | 107E Life Safety Code* | 423 Aircraft Engine Test Facilities |
| 12B Halon 1211 Systems | 51B Welding Processes | 107F Life Safety Code* | 424 Airport/Community Emerg. Planning |
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| 13D Sprinkler Syst., Drawings | 54M Home Respiratory Therapy | 130 Fixed Guideway Transit Syst. | 502 Highways, Tunnels, Bridges |
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| 15 Water Spray Fixed Syst. | 61A Starch, Mfg. Handling | 174 Fire Protection Symbols for Risk Analysis Diagrams | 513 Motor Freight Terminals |
| 16 Deluge Foam-Water Systems | 61B Grain Elevators | 178 Symbols — Fire Fighting Operations | 601 Guard Services |
| 16A Closed Head Foam-Water Sprinkler Syst. | 61C Feed Mills | 203M Roof Coverings | 701 Fire Tests, Textiles, Films |
| 17 Dry Chem. Ext. Systems | 61D Agricultural Commodities | 204M Smokes, Heat Venting | 702 Weaving Apparel |
| 18 Wetting Agents | 66 Aluminum Processing | 211 Chimneys, Fireplaces, Vents | 703 Fire-Resistant Treatments of Bldg. Mat'ls. |
| 20 Centrifugal Fire Pumps | 66 Pneumatic Conveying Syst. | 214 Water Cooling Towers | 704 Ident. of Materials |
| 21 Steam Fire Pumps | 66 Plastics, Expl. Prevent. | 224 Homes, Forest Areas | 801 Radioactive Mat'l. Facil. |
| 22 Water Tanks | 66 Sulfur Fires | 220 Types Bldg. Construction | 802 Nuclear Research Reactions |
| 24 Private Fire Service Mains | 68 Explosion Venting | 231 Indoor General Storage | 803 Light Water Nuclear Power Plants |
| 26 Sup'r's, Water Supply Valves | 68 Explosion Prev. Syst. | 231C Rack Storage of Mat'ls. | 901 Uniform Coding for F. P. |
| 27 Private Fire Brigades | 70 Nat'l Electrical Code* | 231D Storage of Rubber Tires | 902M Field Incident Manual |
| 28 Fire Hydrants | 70A Dwelling Electrical Code | 231E Storage of Baled Cotton | 903M Property Survey Manual |
| 29 Fire Hydrants | 70B Elect. Equip., Maint. | 231F Storage of Roll Paper | 904M Investigative Report Manual |
| 296 Wildlife Control | 70C Inspection of Elect. Installations | 232 Protection of Records | 907M Investigation of Fires of Elec. Origin |
| 30 Flammable Liquids Code | 71 General Station Sig. | 241 Bldg. Const. Operation | 910 Libraries and Library Collections |
| 31 Oil Burning Equipment | 72A Local Protective Syst. | 241 Bldg. Const. Operation | 911 Museums and Museum Collections |
| 32 Drying/seasoning Plants | 72B Auxiliary Sig. System | 251 Fire Tests Bldg. Const. & Mat'ls. | 1001 Fire Fighter Prof. Qual. |
| 321 Cities, Flammable Liquids | 72C Remote Station System | 252 Fire Tests Door Assem. | 1002 Driver Prof. Qual. |
| 322M Prop. Flammable Liquids | 72D Proprietary Sig. Syst. | 253 Flooring Radiant Panel Test | 1003 Airport Fire Fighter Prof. Qual. |
| 327 Cleaning Small Tanks | 72E Aust. Fire Detectors | 253 Burning Character, Bldg. Mat'ls. | 1001 Fire Officer Prof. Qual. |
| 328 Manholes, Sewers, Flammable Liquids and Gases in Tanks | 72H Testing Prot. Sig. Syst. | 256 Tests Roof Coverings | 1041 Fire Inspector Prof. Qual. |
| 329 Underground Leakage, Flammable Liquid Tanks | 74 Household Warning Equip. | 257 Window Assemblies | 1121L Model State Fireworks Law |
| 33 Spray Application | 75 Electronic Computer Syst. | 258 Tests Smoke Generated | 1122 Unannounced Residents Code |
| 34 Dipping and Coating Processes | 77 9400 Electricity | 259 Tests Heat of Bldg. Mat'ls. | 1201 Fireworks, Public Display |
| 35 Mfg. Organic Coatings | 78 Lifting Prot. Code | 260A Cfg. Ignition Resistances — Components of Furniture | 1202 Fire Dept. Organization |
| 36 Solvent Extraction | 79 Electrical Marking Machine Tools and Plastics Processing Machinery | 260B Cfg. Ignition Resistances — Components of Furniture | 1201 Organization, Fire Services |
| 37 Combustion Engines | 80 Fire Doors, Windows | 302 Pressure and Commercial Motor Craft | 1221 Public Fire Serv. Comm. |
| 385 Tank Vehicles | 80A Exposure Fires, Prot. | 303 Marinas and Boatyards | 1231 Suburban & Rural Water Supplies |
| 386 Portable Shipping Tanks | 81 Fur Storage & Cleaning | 308 Gas Hazards on Vessels | 1301 Public Fire Prev. Criteria |
| 387 Farm Sig. Flammable Liquids | 82 Incinerators, Rubbish | 312 Vessels, Const., Repair | 1401 Training Reports, Records |
| 40 Motion Picture Film | 85A Single Burner Boiler-Furnaces | 402 Aircraft Rescue Process. | 1410 Initial Fire Attack |
| 40E Pyroxylin Plastics | 85B Gas Multi-Burner Boiler | 403 Aircraft Rescue Services | 1801 Fire Dept. Safety Officer |
| 43A Liquid, Solid Oxidizing Materials | 85C Oil Multi-Burner Boiler | 408M Aircraft Rec., Fire Fighting, Using Structural Equip. | 1801 Automotive Fire Apparatus |
| 43C Gaseous Oxidizing Materials | 85F Patentized Fuel Systems | 408 Aircraft Extinguishers | 1904 Aerial Ladders & Elev. Platforms |
| 43D Pesticides in Port. Containers | 85G Impulsions in Multi-Burner Boiler | 410 Aircraft Maintenance | 1921 Portable Pumping Units |
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| 482 Zirconium | | | 1982 Personal Alert Safety System for Fire Fighters |
| 49 Hazardous Chem. Data | | | |
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| 495 Explosives, Sigs., Use | | | |

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(d) **Feeder Circuit Capacity.** Recreational vehicle site feeder circuit conductors shall have adequate ampacity for the loads supplied, and shall be rated at not less than 30 amperes.

551-45. Overcurrent Protection. Overcurrent protection shall be provided in accordance with Article 240.

551-46. Grounding. All electrical equipment and installations in recreational vehicle parks shall be grounded as required by Article 250.

551-47. Recreational Vehicle Site Supply Equipment.

(a) **Location.** Where provided, the recreational vehicle site electrical supply equipment shall be located on the left (road) side of the parked vehicle, on a line which is 9 feet (2.74 m), ± 1 foot (0.3 m), from the longitudinal centerline of the stand and shall be located at any point on this line from the rear of the stand to 15 feet (4.57 m) forward of the rear of the stand.

(b) **Disconnecting Means.** A disconnecting switch or circuit breaker shall be provided in the site supply equipment for disconnecting the power supply to the recreational vehicle.

(c) **Access.** All site supply equipment shall be accessible by an unobstructed entrance or passageway not less than 2 feet (610 mm) wide and 6½ feet (1.98 m) high.

(d) **Mounting Height.** Site supply equipment shall be located not less than 2 feet (610 mm) nor more than 6½ feet (1.98 m) above the ground.

(e) **Working Space.** Sufficient space shall be provided and maintained about all electric equipment to permit ready and safe operation, in accordance with Section 110-16.

551-48. Grounding, Recreational Vehicle Site Supply Equipment.

(a) **Exposed Noncurrent-Carrying Metal Parts.** Exposed noncurrent-carrying metal parts of fixed equipment, metal boxes, cabinets, and fittings, which are not electrically connected to grounded equipment, shall be grounded by a continuous grounding conductor run with the circuit conductors from the service equipments or from the transformer of a secondary distribution system. Equipment grounding conductors shall be sized in accordance with Section 250-95.

(b) **Secondary Distribution System.** Each secondary distribution system shall be grounded at the transformer.

(c) **Neutral Conductor Not to Be Used as an Equipment Ground.** The neutral conductor shall not be used as an equipment ground for recreational vehicles or equipment within the recreational vehicle park.

(d) **No Connection on the Load Side.** No connection to a grounding electrode shall be made to the neutral conductor on the load side of the service disconnecting means or transformer distribution panelboard.

551-49. Protection of Outdoor Equipment.

(a) **Wet Locations.** All switches, circuit breakers, receptacles, control equipment, and metering devices located in wet places or outside of a building shall be rainproof equipment.

A. Marinas and Boatyards

555-2. Application of Other Articles. Wiring and equipment for marinas and boatyards shall comply with this article and also with the applicable provisions of other articles of this Code.

See notes following Sections 210-19(a) and 215-2(c) for voltage drop on branch circuits and feeders respectively.

(FPN): For disconnection of auxiliary power from boats, see Motor Craft, NFPA 302-1980 (ANSI).

555-3. Receptacles. Receptacles that provide shore power for boats shall be rated not less than 20 amperes and shall be single and of the locking and grounding types.

Fifteen- and 20-ampere, single-phase, 125-volt receptacles other than those supplying shore power to boats located at piers, wharfs, and other locations shall be protected by ground-fault circuit-interrupters.

(FPN): For various configurations and ratings of locking- and grounding-type receptacles and caps, see Dimensions of Caps, Plugs, and Receptacles, ANSI C73-1972.

(FPN): In locating receptacles consideration should be given to the maximum tide level and wave action.

555-4. Branch Circuits. Each single receptacle that supplies shore power to boats shall be supplied from a power outlet or panelboard by an individual or multiwire branch circuit of the voltage class and rating corresponding to the rating of the receptacle.

555-5. Feeders and Services. The load for each ungrounded feeder and service conductor supplying receptacles that supply shore power for boats shall be calculated as follows:

For 1 to 4 receptacles	100%	of the sum of the rating of the receptacles							
For 5 to 8	90%	"	"	"	"	"	"	"	"
For 9 to 13	80%	"	"	"	"	"	"	"	"
For 14 to 30	70%	"	"	"	"	"	"	"	"
For 31 to 50	50%	"	"	"	"	"	"	"	"
For 50 to 100	40%	"	"	"	"	"	"	"	"
For over 100	30%	"	"	"	"	"	"	"	"

555-6. Wiring Methods. The wiring method shall be one or more of the following identified as suitable for use where exposed to the weather or water: (1) rigid nonmetallic conduit; (2) mineral-insulated, metal-sheathed cable; (3) nonmetallic cable; (4) corrosion-resistant rigid metal conduit; (5) corrosion-resistant intermediate metal conduit; (6) underground wiring that complies with the requirements of this Code; (7) Type MC cable.

Exception No. 1: Where flexibility is required, other types identified for the purpose.

Exception No. 2: Open wiring shall be permitted by special permission.

(FPN): In granting special permission, major factors include possible contact of open wires with masts, cranes, or similar structures or equipment.

(FPN): For further information on wiring methods for various locations, see Fire Protection Standard for Marinas and Boatyards, NFPA 303-1975.

(2) An upper limit of 18 inches (457 mm) measured vertically from the base of the dispenser.

(3) A lower limit which shall be the lowest water surface.

(FPN): For further information, see *Marinas and Boatyards*, NFPA 303-1975.

555-11. Sealing.

(a) **At Dispenser.** An approved seal shall be provided in each conduit run entering or leaving a dispenser or any cavities or enclosures in direct communication therewith.

(b) **At Boundary.** Additional seals shall be provided in accordance with Section 501-5. Section 501-5(a)(4) and (b)(2) shall apply to horizontal as well as to vertical boundaries of the defined hazardous (classified) locations.

B. Floating Dwelling Units (FDU)

555-20. General. This part covers floating dwelling units and services and feeders to the associated pier, dock, or wharf to which they are moored.

555-21. Application of Other Articles. Wiring and equipment for floating dwelling units shall comply with this article, and also with the applicable provisions of other articles of this Code.

555-22. Services. Overhead service wiring shall be installed so that changes in water level will not result in unsafe clearances. The floating dwelling unit service equipment shall be located adjacent to the floating dwelling unit and not mounted in or on the unit.

555-23. Connection of Service and Feeders. Flexibility of the wiring system shall be maintained between the floating dwelling units and the supply conductors.

555-24. Grounding. Ground continuity shall be assured between an earth ground on the shore, the floating dwelling unit and the incoming electric distribution system.

Supplement to the
NATIONAL ELECTRICAL CODE

Marinas & Boatyards

NFPA

Article 303-1975

Chapter 5 Electrical Wiring and Equipment

5-1 Hazards arising from the presence of electrical systems and electrical equipment in the marina and boatyard requiring special precautions are:

- (a) Wet or continuously damp areas, exposed to rain, wind-driven spray and atmospheric moisture.
- (b) Areas subject to flooding by abnormally high water.
- (c) Areas in which flammable liquids or gases are stored, dispensed or used.
- (d) The use of electrical equipment and facilities by persons not under the control of the management, many of whom are unfamiliar with the hazards which can be created by such use, and the means of avoiding them.

5-2 The *National Electrical Code, NFPA 70*, provides basic provisions to be observed in the design, selection and installation of electrical wiring and equipment. The recommendations set forth herein supplement and relate the requirements of the *National Electrical Code* to the specific hazards and combinations of hazards found in marinas, boatyards, boat basins and establishments of similar type.

5-3 General. All electrical wiring, conduit, enclosures and equipment, and the provision of circuit protective devices, shall conform to the applicable requirements of the *National Electrical Code* and to the applicable requirements of this standard.

5-4. Classification of Locations within Marinas and Boatyards. All areas of marinas, boatyards, boat basins and similar establishments shall be properly related to one of the location classifications as herein described for the purpose of determining suitable arrangements of electrical wiring, and electrical equipment. The classification of all areas shall be related to a datum-level which shall be calculated for each establishment according to the following formula:

- (a) In areas subject to tidal fluctuation the datum-level shall be established at a point two feet above the highest tide level recorded by the U.S. Coast Guard in the area. (*See Exception below.*)
- (b) In areas inland and not subject to tidal fluctuation, the datum-level shall be established at a point two feet above the highest water level recorded by local sources at that area, or if

the private property area, in compliance with the requirements of Article 450, *National Electrical Code*, with the additional requirement that transformers shall not be located in a Wet Location as herein described, and if located in a Damp Location shall be of type approved for use in such locations.

5-5.6 Main service equipment, including service disconnecting equipment, meters and associated equipment, and the main switchboard or panel, if not installed in a Standard Location, shall be installed in a Damp Location and be protected from the weather in an approved manner, and shall be protected against access by unauthorized persons. Main service equipment shall not be installed in Wet Locations. In other respects the main service installation shall be in compliance with the requirements of Article 230, *National Electrical Code*.

5-5.7 When auxiliary emergency standby power supply equipment with an output rating in excess of 5 kw is provided and is driven by an internal combustion engine, the emergency electric system shall be arranged as required by Article 700, *National Electrical Code*, and shall also be arranged as follows:

(a) The engine and generator shall be housed in a well-ventilated fire-resistive enclosure not located in a Wet Location and which shall contain only the auxiliary power unit and the necessary controls for the engine. Interior areas of the enclosure shall be lighted by a fixture connected to the normal power supply. An approved battery-powered emergency lighting fixture conforming to the requirements of Section 700-6, *National Electrical Code*, shall be permanently installed in the enclosure, arranged to illuminate the engine control equipment. The fuel supply tank or tanks for the auxiliary power equipment shall be located outside of the structure and shall fully comply with the requirements of this standard related to the storage and handling of flammable liquid fuels.

(b) The requirements for automatic starting of the emergency generator as included in Section 700-6, *National Electrical Code*, may be waived if the starting battery for the prime mover is maintained on a reliable trickle-charge and is tested by actually starting the prime mover at monthly intervals, as required by Section 700-4, *National Electrical Code*.

5-5.8 The transfer switch for use in connecting an auxiliary emergency generator to the selected load circuits shall be a manually operated double throw switch, with wiring arranged to disconnect the selected circuits from the normal power source before the auxiliary source is connected to these circuits, and shall be of proper rating to make and break the full load current for all the

5-7 Standard Locations. The entire electrical system installed in a Standard Location shall comply with the requirements of the *National Electrical Code*.

5-8 Damp Locations. The entire electrical system installed in a Damp Location shall be composed of materials approved for the purpose (as defined in Article 100, *National Electrical Code*).

5-9 Wet Locations. The entire electrical system in a Wet Location shall be composed of materials suitable for compliance with the definition of "wet locations" as given in Article 100, *National Electrical Code*.

5-10 Hazardous Locations.

5-10.1 The entire electrical system installed in a Hazardous Location shall comply with the requirements as given in Article 500, *National Electrical Code*, and in addition, when required by the conditions, to the requirements of this Standard related to Damp and Wet Locations.

5-10.2 Wiring and electrical equipment installed on piers, wharves, docks or similar locations shall specifically conform to the requirements of Article 555, *National Electrical Code*, when located in proximity to gasoline dispensing equipment.

5-11 Wiring Methods and Materials (Damp and Wet Locations).

5-11.1 The wiring method shall be rigid metal conduit or rigid nonmetallic conduit.

Exception No. 1: Where flexibility is required the wiring method shall be other approved types.

Exception No. 2: As permitted by Article 225, National Electrical Code, for outside branch circuits and feeders.

5-11.2 It is recommended that all electrical wiring be installed underground to avoid possible contact with masts and other parts of boats being moved in the yard. Underground electrical installations shall comply with the requirements of Sections 230-30, 31, 48 and 49, *National Electrical Code*.

5-11.3 If electrical wiring is not installed underground, the wiring within yard areas shall be routed to:

(a) Avoid wiring within or across any portion of the yard which may be used for moving vessels.

in a panel enclosure for protection of a circuit to a single lighting fixture which is installed as part of a panel assembly on a pier.

5-12.2 Circuit breakers installed in gasketed enclosures which are located where exposed to the direct rays of the sun shall be of the fully magnetic type, with no thermal elements.

5-12.3 Circuit breakers and switches installed in gasketed enclosures shall be arranged to permit required manual operation without exposing the interior of the enclosure. All such enclosures shall be arranged with a weep-hole to discharge condensation.

5-12.4 Circuit breakers, switches and panels shall not be installed in Wet Locations.

5-12.5 Devices which contain one or more circuit breakers and one or more receptacles intended for use as power outlets for boats shall be considered to be panels for the purposes of this standard.

5-12.6 Circuit breakers, switches and panels permanently installed on piers shall be located to provide a height of not less than thirty (30) inches nor more than forty (40) inches for the bottom of the enclosure above the deck below.

5-12.7 All electrical enclosures installed on piers above deck level shall be securely and substantially supported by structural members, independent of any conduit connected to them. If enclosures are not attached to mounting surfaces by means of external ears or lugs, the internal screw heads must rest on gaskets to prevent seepage of water through mounting holes.

5-12.8 It is recommended that a mooring bitt be located on pier decks in front of supports as mooring or warping means.

5-13 Feeders and Branch Circuits on Piers.

5-13.1 The load for each ungrounded feeder and service conductor supplying receptacles for the connection of power to boats shall be calculated as follows:

For 1 to 4 receptacles 100% of the sum of the rating of the receptacles

For 5 to 8 receptacles 90% of the sum of the rating of the receptacles

For 9 to 13 receptacles 80% of the sum of the rating of the receptacles

For 14 or more receptacles 70% of the sum of the rating of the receptacles.

branch circuit of the voltage class and rating corresponding to the rating of the receptacle.

5-14.4 Fifteen and 20 ampere outdoor receptacles, other than those supplying shore power to boats, shall be protected as required by Section 555-3, *National Electrical Code*.

5-14.5 All receptacles shall be installed in enclosures and shall be equipped with an approved means of preventing the entrance of water by rain or splash to the receptacle contacts when the receptacle is not in use.

5-14.6 A special sign, stating the maximum voltage and current (in amperes) available from the shore service connection outlets, shall be permanently located at the shore end of each pier on which electrical outlets for shore service connections are provided, and on a wall visible to all within the office where arrangements are made for berthing facilities. Each such sign shall contain the following additional message in large letters:

"CAUTION": "CONNECTION SHALL NOT BE MADE TO ANY SHORE POWER OUTLET WITHOUT PERMISSION OF THE MANAGEMENT."

5-15 Lighting Fixtures.

5-15.1 Lighting fixtures shall conform to the requirements of the *National Electrical Code* (Sections 410-4, 410-5 and 410-6), and additionally shall be located to prevent damage by contact with stored or moving material.

5-15.2 Lighting fixtures which are located where the light rays are transmitted offshore shall be suitably shielded to comply with the safety regulations of the U. S. Coast Guard.

5-15.3 Switches for control of individual lighting fixtures located where exposed to the weather or splash shall be of a type approved for that location.

5-16 Hazardous Locations.

5-16.1 Only qualified persons, as defined in Article 100, *National Electrical Code*, shall be permitted to use, handle, install or repair electrical systems or facilities within any area classed as "Hazardous."

5-16.2 Only the electrical equipment and wiring necessary for the handling and dispensing of the fuels shall be installed within the hazardous area at any outdoor storage or dispensing station.

5-18.3 Where it is necessary to provide electric power to a mobile crane or hoist in the yard, and a trailing cable is involved, it shall consist of the parallel Type W cable with a jacket of distinctive color for safety.

5-19. Maintenance of Electrical Wiring and Equipment.

5-19.1 A complete inspection of all electrical wiring, ground connections, conduit, hangers, supports, connections, outlets, appliances, devices and portable cords installed or used in a marina, boaryard, boat basin or similar establishment, shall be made at intervals of not more than 30 days by an assigned representative of the management. All corroded, worn, broken or improper materials shall be replaced or repaired immediately. The use of tape to repair broken or cracked insulation or sheathing on portable cords shall not be tolerated. The inspection shall take particular notice of the following conditions:

(a) Areas being used for purposes not originally contemplated and which introduce hazards greater than those for which the electrical system was designed.

(b) Locked or otherwise restricted areas or equipment being left open.

(c) The use of portable electrical equipment which is not properly and adequately grounded as required by this standard. Special attention to be given to portable cords used by vessels for connection to shore power outlets. Such cords shall meet the requirements of this standard and should not be permitted to lie on or across pier walkways or to trail into the water.

(d) Portable cords used for permanent wiring.

(e) Damaged or inoperative switches, lighting fixtures and receptacle outlets.

(f) Overloading of electrical circuits.

(g) The use of "jumpers" between special types of receptacles and common connectors which defeats the purpose for which special receptacles were installed.

(h) The introduction into hazardous areas of unsuitable appliances.

APPENDIX

Formulas for Determining Amperes, HP, KW and KVA

To Find	Direct Current	Alternating Current		
		Single Phase	2 Phase — 4 Wire†	Three Phase
Amperes when Horsepower is Known	$\frac{hp \times 746}{E \times \% \text{ eff}}$	$\frac{hp \times 746}{E \times \% \text{ eff} \times p-f}$	$\frac{hp \times 746}{2 \times E \times \% \text{ eff} \times p-f}$	$\frac{hp \times 746}{1.73 \times E \times \% \text{ eff} \times p-f}$
Amperes when Kilowatts is Known	$\frac{kw \times 1000}{E}$	$\frac{kw \times 1000}{E \times p-f}$	$\frac{kw \times 1000}{2 \times E \times p-f}$	$\frac{kw \times 1000}{1.73 \times E \times p-f}$
Amperes when KVA is Known		$\frac{kva \times 1000}{E}$	$\frac{kva \times 1000}{2 \times E}$	$\frac{kva \times 1000}{1.73 \times E}$
Kilowatts	$\frac{I \times E}{1000}$	$\frac{I \times E \times p-f}{1000}$	$\frac{I \times E \times 2 \times p-f}{1000}$	$\frac{I \times E \times 1.73 \times p-f}{1000}$
KVA		$\frac{I \times E}{1000}$	$\frac{I \times E \times 2}{1000}$	$\frac{I \times E \times 1.73}{1000}$
Horsepower (output)	$\frac{I \times E \times \% \text{ eff}}{746}$	$\frac{I \times E \times \% \text{ eff} \times p-f}{746}$	$\frac{I \times E \times 2 \times \% \text{ eff} \times p-f}{746}$	$\frac{I \times E \times 1.73 \times \% \text{ eff} \times p-f}{746}$

† For 3-wire, 2-phase circuits the current in the common conductor is 1.41 times that in either of the two other conductors.

Common Electrical Terms

Ampere (I) = unit of current or rate of flow of electricity
Volt (E) = unit of electromotive force
Ohm (R) = unit of resistance
 Ohms Law— $I = \frac{E}{R}$ (d-c or 100% p-f)
Megohm = 1,000,000 ohms
Volt Amperes (va) = unit of apparent power
 = EI (single phase)
 = $E \times I \times 1.73$ (3 phase)
Kilovolt Amperes (kva) = 1000 volt-amperes
Watt (w) = unit of true power
 = $va \times p-f$
 = .00134 hp
Kilowatt (kw) = 1000 watts
Power Factor (p-f) = ratio of true to apparent power
 $w \dots kw$

Watthour (whr) = unit of electrical work
 = one watt for one hour
 = 3.413 Btu
 = 2.655 ft lbs
Kilowatthour (kwhr) = 1000 watthours
Horsepower (hp) = measure of time rate of doing work
 = equivalent of raising 33,000 lbs, one ft in one minute
 = 746 watts

Table 3A. Maximum Number of Conductors in Trade Sizes of Conduit or Tubing
(Based on Table 1, Chapter 9)

Conduit Trade Size (Inches)		½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Type Letters	Conductor Size AWG, MCM												
F, RUH, UW, HW (14 thru 8)	14	9	15	25	44	60	99	142					
	12	7	12	19	35	47	78	111	171				
	10	5	9	15	26	36	60	85	131	176			
	8	2	4	7	12	17	28	40	62	84	108		
IW and RHH (without outer jacketing), V	14	6	10	16	29	40	65	93	143	192			
	12	4	8	13	24	32	53	76	117	157			
	10	4	6	11	19	26	43	61	95	127	163		
	8	1	3	5	10	13	22	32	49	66	85	133	
V, UH (6 thru 2), UW (6 thru 2), (6 thru 2), V and UH (with- out outer jacketing)	6	1	2	4	7	10	16	23	36	48	62	97	141
	4	1	1	3	5	7	12	17	27	36	47	73	106
	3	1	1	2	4	6	10	15	23	31	40	63	91
	2	1	1	2	4	5	9	13	20	27	34	54	78
	1	1	1	1	3	4	6	9	14	19	25	39	57
	0		1	1	2	3	5	8	12	16	21	33	49
	00		1	1	1	3	5	7	10	14	18	29	41
	000		1	1	1	2	4	6	9	12	15	24	35
	0000		1	1	1	1	3	5	7	10	13	20	29
	250			1	1	1	2	4	6	8	10	16	23
	300			1	1	1	2	3	5	7	9	14	20
	350			1	1	1	1	3	4	6	8	12	18
	400			1	1	1	1	2	4	5	7	11	16
	500			1	1	1	1	1	3	4	6	9	14
	600					1	1	1	3	4	5	7	11
	700					1	1	1	2	3	4	7	10
	750					1	1	1	2	3	4	6	9

Conduit Trade Size (Inches)		½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Type Letters	Conductor Size AWG, MCM												
V, 14 thru 2), 14 thru 8), 4 thru 4/0) 1 (14 thru 4/0) thru 4/0) (4 thru M)	14	13	24	39	69	94	154						
	12	10	18	29	51	70	114	164					
	10	6	11	18	32	44	73	104	160				
	8	3	5	9	16	22	36	51	79	106	136		
	6	1	4	6	11	15	26	37	57	76	98	154	
	4	1	2	4	7	9	16	22	35	47	60	94	137
	3	1	1	3	6	8	13	19	29	39	51	80	116
	2	1	1	3	5	7	11	16	25	33	43	67	97
	1	1	1	1	3	5	8	12	18	25	32	50	72
	0		1	1	3	4	7	10	15	21	27	42	61
	00		1	1	2	3	6	8	13	17	22	35	51
	000		1	1	1	3	5	7	11	14	18	29	42
	0000		1	1	1	2	4	6	9	12	15	24	35
	250			1	1	1	3	4	7	10	12	20	28
	300			1	1	1	3	4	6	8	11	17	24
	350			1	1	1	2	3	5	7	9	15	21
	400			1	1	1	1	3	5	6	8	13	19
	500				1	1	1	2	4	5	7	11	16
	600				1	1	1	1	3	4	5	9	13
	700					1	1	1	3	4	5	8	11
	750					1	1	1	2	3	4	7	11
	6	1	3	5	9	13	21	30	47	63	81	128	185
	600				1	1	1	1	2	3	4	7	11

Table 310-16. Ampacities of Insulated Conductors
Rated 0-2000 Volts, 60° to 90°C

Not More Than Three Conductors in Raceway or Cable or Earth
(Directly Buried), Based on Ambient Temperature of 30°C (86°F)

Size	Temperature Rating of Conductor, See Table 310-13								Size
	60°C (140°F)	75°C (167°F)	85°C (185°F)	90°C (194°F)	90°C (194°F)	75°C (167°F)	85°C (185°F)	90°C (194°F)	
AWG MCM	TYPES THW, TT, TW, UF	TYPES FEPW, RHL, RHW, THW, THWN, XHHW, USE, ZW	TYPES V, MV	TYPES TA, TBS, SA, AVE, SIS, FEP, FEPE, RHH, THHN, XHHW*	TYPES THW, TT, TW, UF	TYPES RHL, RHW, THW, THWN, XHHW, USE	TYPES V, MV	TYPES TA, TBS, SA, AVE, SIS, RHH, THHN, XHHW*	AWG MCM
	COPPER				ALUMINUM OR COPPER-CLAD ALUMINUM				
18	.....	.....	.....	14	.....	.....	.....	.....	.....
16	.....	.....	18	18	.....	.....	.....	.....	.....
14	20†	20†	25	25†	.....	.....	.....	.....	.....
12	25†	25†	30	30†	20†	20†	25	25†	12
10	30	35†	40	40†	25	30†	30	35†	10
8	40	50	55	55	30	40	40	45	8
6	55	65	70	75	40	50	55	60	6
4	70	85	95	95	55	65	75	75	4
3	85	100	110	110	65	75	85	85	3
2	95	115	125	130	75	90	100	100	2
1	110	130	145	150	85	100	110	115	1
0	125	150	165	170	100	120	130	135	0
00	145	175	190	195	115	135	145	150	00
000	165	200	215	225	130	155	170	175	000
0000	195	230	250	260	150	180	195	205	0000
250	215	255	275	290	170	205	220	230	250
300	240	285	310	320	190	230	250	255	300
350	260	310	340	350	210	250	270	280	350
400	280	335	365	380	225	270	295	305	400
500	320	380	415	430	260	310	335	350	500
600	355	420	460	475	285	340	370	385	600
700	385	460	500	520	310	375	405	420	700
750	400	475	515	535	320	385	420	435	750
800	410	490	535	555	330	395	430	450	800
900	435	520	565	585	355	425	465	480	900
1000	455	545	590	615	375	445	485	500	1000
1250	495	590	640	665	405	485	525	545	1250
1500	520	625	680	705	435	520	565	585	1500
1750	545	650	705	735	455	545	595	615	1750
2000	560	665	725	750	470	560	610	630	2000
AMPACITY CORRECTION FACTORS									
Ambient Temp., °C	For ambient temperatures other than 30°C, multiply the ampacities shown above by the appropriate factor shown below.								Ambient Temp., °F
31-40	.82	.88	.90	.91	.82	.88	.90	.91	87-104
41-45	.71	.82	.85	.87	.71	.82	.85	.87	105-113
46-50	.58	.75	.80	.82	.58	.75	.80	.82	114-122
51-60	.....	.58	.67	.71	.....	.58	.67	.71	123-141
61-70	.....	.35	.52	.58	.....	.35	.52	.58	142-158
71-80	.....	.....	.30	.41	.....	.....	.30	.41	159-176

† The overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG, and 30 amperes for 10 AWG copper; or 15 amperes for 12 AWG and 25 amperes for 10 AWG aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

* For dry locations only. See 75°C column for wet locations.

**FULL LOAD CURRENTS IN AMPERES
SINGLE PHASE DRY-TYPE TRANSFORMERS**

K.V.A. Rating	RATED LINE VOLTAGE				
	120	240	277	480	600
.25	2.08	1.04	.9	0.52	0.42
.5	4.16	2.08	1.8	1.04	0.84
.75	6.24	3.12	2.7	1.56	1.2
1.0	8.33	4.16	3.6	2.08	1.6
1.5	12.5	6.24	5.4	3.12	2.4
2.0	16.66	8.33	7.2	4.16	3.2
3.0	25	12.5	10.8	6.1	4.8
5.0	41	21	18	10.4	8.3
7.5	62	31	27	15.6	12.5
10.0	83	42	36	21	16.5
15.0	124	62	54	31	25
20.0	166	83	72	42	33
25.0	208	104	90	52	42
30.0	249	125	108	62	50
37.5	312	156	135	78	62
50	416	208	180	104	84
75	624	312	270	156	124
100	830	415	360	207	168
125	1040	520	450	260	208
150	1248	624	540	312	248
167	1390	695	601	348	278
200	1660	833	720	416	336
250	2080	1040	900	520	420
333	2780	1390	1199	695	555
400	3320	1660	1440	830	672
500	4160	2080	1800	1040	840
600	5000	2500	2160	1250	1000
750	6240	3120	2700	1560	1240
1000	8300	4150	3600	2075	1680

FORMULA

$$\text{Single Phase KVA} = \frac{\text{Volts} \times \text{Load Amperes}}{1000}$$

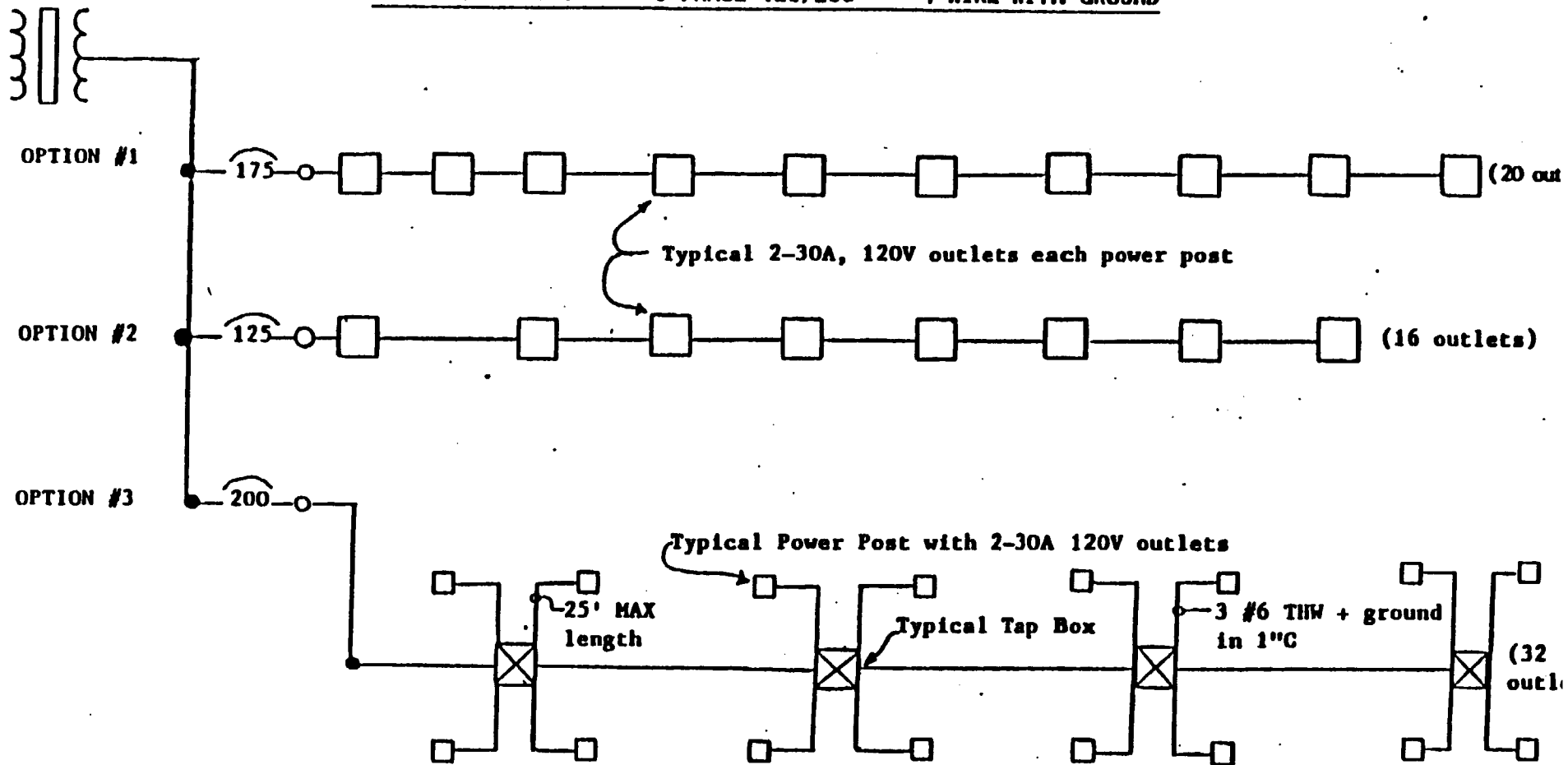
**FULL LOAD CURRENTS IN AMPERES
THREE PHASE DRY-TYPE TRANSFORMERS**

K.V.A. Rating	RATED LINE VOLTAGE				
	120	208	240	480	600
6	28.8	16.6	14.4	7.2	5.8
9	43.2	25.0	21.6	10.8	8.7
18	86.0	27.7	24	12	9.8
15	72.0	41.6	36	18	14.4
20	96	55.5	48	24	19.0
25	120	69.5	60	30	24.0
30	144	83.0	72	36	28.8
37.5	180	104	90	45	36
45	216	125	108	54	43
60	240	138	120	60	48
75	360	206	180	90	72
100	480	278	240	120	96
112.5	540	312	270	135	108
150	720	415	360	180	144
200	960	554	480	240	192
225	1080	625	540	270	216
250	1200	695	600	300	240
300	1440	830	720	360	288
400	1920	1110	960	480	384
500	2400	1380	1200	600	480
600	2880	1660	1440	720	576
750	3600	2080	1800	900	720
1000	4800	2780	2400	1200	960
1500	7200	4150	3600	1800	1440
2000	9600	5540	4800	2400	1920

FORMULA

$$\text{Three Phase KVA} = \frac{\text{Volts} \times \text{Load Amperes} \times 1.73}{1000}$$

TYPICAL CIRCUITS - 3 PHASE 120/208 - 4 WIRE WITH GROUND



OPTION #1 - 120/208 3 Phase, 4 Wire feed using 90° C rated "G" cable
4 C-1/0 - 4 W - with insulated ground

Demand (151 A)
Cable rated for (165 A)

OPTION #2 - 120/208 3 Phase, 4 Wire feed using conduit and THW wire at 75° C
4 C-1/0 with #6 ground in 2" conduit

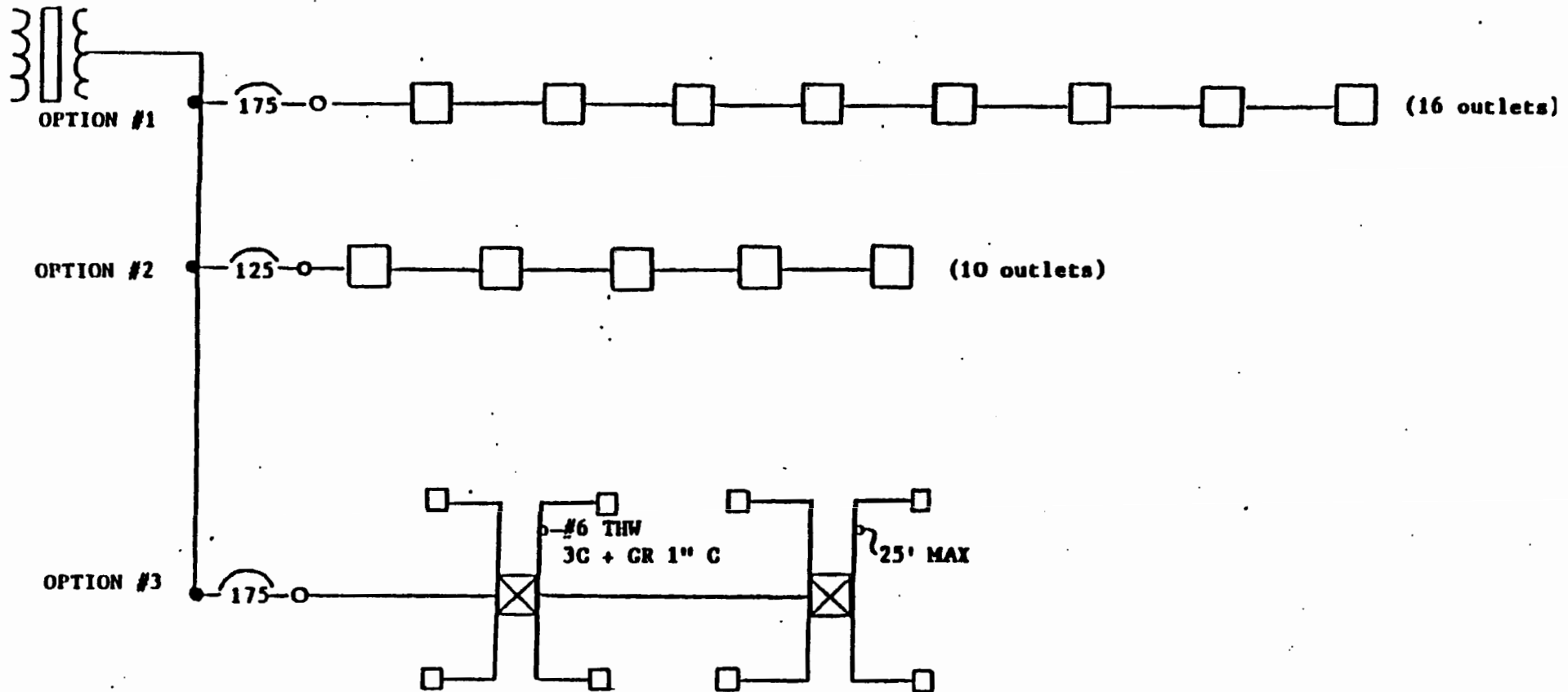
Demand (120 A)
Wire rated for (120 A)

OPTION #3 - 120/208 3 Phase, 4 Wire feed using conduit and tap boxes
4 C-4/0 with #2 ground in 2½" C

Demand (172 A)
Wire rated for (180 A)

Design only, must be approved locally

TYPICAL CIRCUITS - 1 PHASE 120/240 - 3 WIRE WITH GROUND



OPTION #1 - 120/240 1 Phase, 3 Wire with ground feed using 90°C rated type "G" cable
3 C 1/0 with #6 insulated ground

Demand (168 A)
Cable rated for (186 A)

OPTION #2 - 120/240 1 Phase, 3 Wire with ground feed using 75°C 1/0 THW in 2" conduit
3 C 1/0 THW 1 #6 ground insulated 2" conduit

Demand (120 A)
Wire rated (120 A)

OPTION #3 - 120/240 1 Phase, 3 Wire with ground feed using tap boxes
3 C-4/0 and #2 ground in 2½" conduit

Demand (168 A)
Wire rated (180 A)

Design only, must be approved locally

VOLTAGE DROP CALCULATIONS

SINGLE PHASE:

$$CM = I \times 11 \times 2 \times L : VD$$

$$VD = I \times 11 \times 2 \times L : CM$$

$$I = CM \times VD : 11 \times 2 \times L$$

$$L = CM \times VD : 11 \times 2 \times I$$

THREE PHASE:

$$CM = I \times 11 \times 1.73 \times L : VD$$

$$VD = I \times 11 \times 1.73 \times L : CM$$

$$I = CM \times VD : 11 \times 1.73$$

$$L = CM \times VD : I \times 11 \times 1.73$$

Calculating voltage drop

Before I review necessary formulae, here are a few reminders:

CM = circular mils

VD = voltage drop

K = resistivity of a mil-foot of any material (In our business, copper or aluminum)

L = length of circuit from source to utilizing device

R = resistance of circuit

(1) One mil-foot is a wire 1 mil in diameter and 1 ft long. Mil-foot resistivity (K) for copper is 10.4 ohms at 20°C (we can use 11 ohms); for aluminum, 17 ohms at 20°C.

Table 8. Conductor Properties

Size AWG/ MCM	Area Cir. Mils	DC Resistance at 75°C, 167°F				Copper		Alumi- num
		Stranding		Overall				
		Quan- tity	Diam. in.	Diam. in.	Area in. ²	Uncoated ohm/MFT	Coated ohm/MFT	ohm/ MFT
18	1620	1	—	0.040	0.001	7.77	8.08	12.8
18	1620	7	0.015	0.046	0.002	7.95	8.45	13.1
16	2580	1	—	0.051	0.002	4.89	5.08	8.05
16	2580	7	0.019	0.058	0.003	4.99	5.29	8.21
14	4110	1	—	0.064	0.003	3.07	3.19	5.06
14	4110	7	0.024	0.073	0.004	3.14	3.26	5.17
12	6530	1	—	0.081	0.005	1.93	2.01	3.18
12	6530	7	0.030	0.092	0.006	1.98	2.05	3.25
10	10380	1	—	0.102	0.008	1.21	1.26	2.00
10	10380	7	0.038	0.116	0.011	1.24	1.29	2.04
8	16510	1	—	0.128	0.013	0.764	0.786	1.26
8	16510	7	0.049	0.146	0.017	0.778	0.809	1.28
6	26240	7	0.061	0.184	0.027	0.491	0.510	0.808
4	41740	7	0.077	0.232	0.042	0.308	0.321	0.508
3	52620	7	0.087	0.260	0.053	0.245	0.254	0.403
2	66360	7	0.097	0.292	0.067	0.194	0.201	0.319
1	83690	19	0.066	0.332	0.087	0.154	0.160	0.253
1/0	105600	19	0.074	0.373	0.109	0.122	0.127	0.201
2/0	133100	19	0.084	0.419	0.138	0.967	0.101	0.159
3/0	167800	19	0.094	0.470	0.173	0.0766	0.0797	0.126
4/0	211600	19	0.106	0.528	0.219	0.0608	0.0626	0.100
250	250,	37	0.082	0.575	0.260	0.0515	0.0535	0.0847
300	300,	37	0.090	0.630	0.312	0.0429	0.0446	0.0707
350	350,	37	0.097	0.681	0.364	0.0367	0.0382	0.0605
400	—	37	0.104	0.728	0.416	0.0321	0.0331	0.0529
500	—	37	0.116	0.813	0.519	0.0258	0.0265	0.0424
600	—	61	0.992	0.893	0.626	0.0214	0.0223	0.0353
700	—	61	0.107	0.964	0.730	0.0184	0.0189	0.0303
750	—	61	0.111	0.998	0.782	0.0171	0.0176	0.0282
800	—	61	0.114	1.03	0.834	0.0161	0.0166	0.0265
900	—	61	0.122	1.09	0.940	0.0143	0.0147	0.0235
1000	—	61	0.128	1.15	1.04	0.0129	0.0132	0.0212
1250	—	91	0.117	1.29	1.30	0.0103	0.0106	0.0169
1500	—	91	0.128	1.41	1.57	0.00858	0.00883	0.0141
1750	—	127	0.117	1.52	1.83	0.00735	0.00756	0.0121
2000	—	127	0.126	1.63	2.09	0.00643	0.00662	0.0106

These resistance values are valid ONLY for the parameters as given. Using conductors having coated strands, different stranding type, and especially, other temperatures, change the resistance.

Formula for temperature change: $R_2 = R_1 [1 + \alpha(T_2 - 20)]$ where: $\alpha_{Cu} = 0.00393$, $\alpha_{Al} = 0.00403$.

Class B stranding is listed as well as solid for some sizes. Its overall diameter and area is that of its circumscribing circle. The construction information is per NEMA WC8-1976 (Rev 5-1980). The resistance is calculated per National Bureau of Standards Handbook 100, dated 1966, and Handbook 109, dated 1972.

Conductors with compact and compressed stranding have about 9 percent and 3 percent, respectively, smaller bare conductor diameters than those shown.

The IACS conductivities used: bare copper = 100%, aluminum = 61%.

**DEPARTMENT
of
BOATING and WATERWAYS**

**Layout and Design
Guidelines
for
Small Craft
Berthing Facilities**

BOATING FACILITIES DIVISION

Gordon K. Van Vleck
Secretary for Resources

George Deukmejian
Governor

William H. Ive
Director

**The Resources
Agency**

**State of
California**

**Department of
Boating and
Waterways**

Layout and Design GUIDELINES for SMALL CRAFT BERTHING FACILITIES

Introduction

These guidelines have been provided to assist in the layout and design of small craft berthing facilities. They are geared to meet average conditions and are not intended to be all inclusive or absolute. Unique conditions and circumstances may require special analysis and design considerations not covered herein.

The primary purpose of these guidelines is to provide technical assistance in the development of those projects funded under the Local Assistance Program of the Department of Boating and Waterways (Cal Boating). The guidelines are, however, useful for marina design in general, and it is the hope of Cal Boating that these guidelines will be helpful to any and all parties involved in the development of marina facilities.

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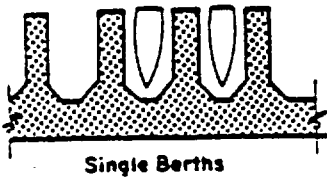
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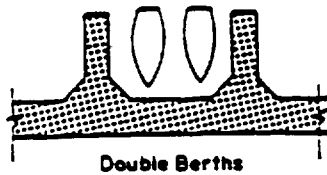
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1-Definitions

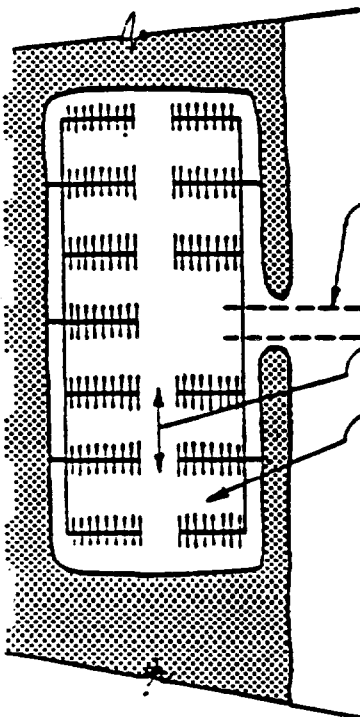


BERTH - a waterside area defined by floating walkways and fingerfloats, the purpose for which is the wet storage of a boat.

Single Berth - a berth designed to accommodate one (1) boat, said berth consisting of a fingerfloat on each side of the berthed boat.



Double Berth - a berth designed to accommodate two (2) boats, said berth consisting of a fingerfloat on one side only of each of the two berthed boats.



CHANNEL -

Entrance - a watercourse, external to a marina proper, by which boats travel between the marina and the main boating water (lake, river, bay, ocean, etc.)

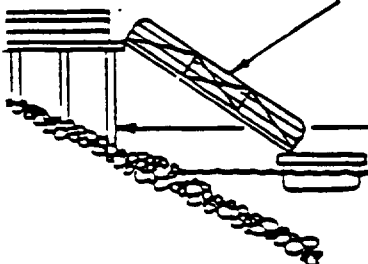
Interior - a watercourse, within a marina by which boats travel between the entrance channel and various fairways.

FAIRWAY -

a watercourse, within a marina, by which boats travel between interior channels and their respective berths.

SERVICE FLOAT - a floating structure equipped to supply oil, gasoline, water, sewage pumpout, and other related services to boats.

GANGWAY (BROW) - a variable slope structure which provides pedestrian access between a fixed pier or shore and a floating structure.



PIER -

a non-floating fixed platform usually extending out over the water from shore and to which gangways are usually attached.

SEWAGE
PUMPOUT
FACILITY -

a facility specifically provided to pump out and receive the contents of holding tanks on-board boats, with holding tanks understood to mean any retention system on a boat which is designed to hold sewage, and which must be emptied from time to time.

WALKWAYS -

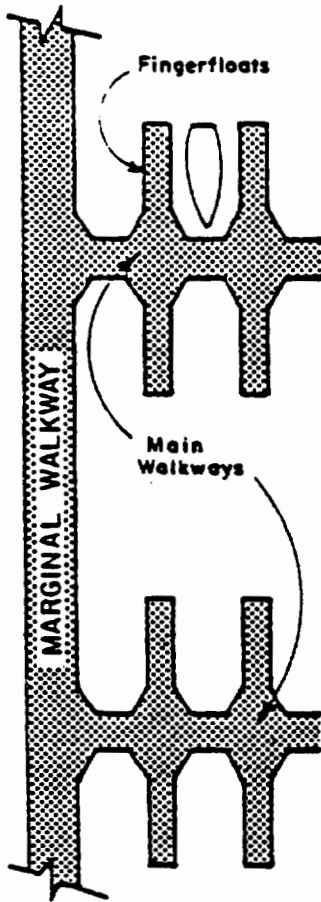
Fingerfloat - a fingerlike floating structure, usually attached perpendicular to a main walkway, which physically defines a berth and provides direct pedestrian access to and from a berthed boat.

Main Walkway - a floating structure which usually lays parallel to a fairway and to which several fingerfloats are attached, thereby providing direct access between the berths and marginal walkways or shore.

Marginal Walkway - a floating structure which provides pedestrian access between two or more main walkways and shore.

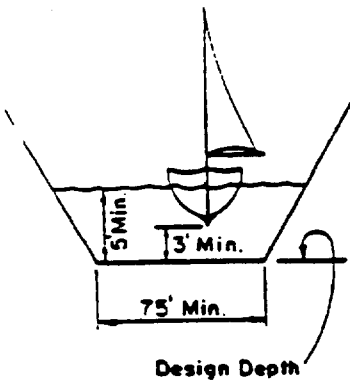
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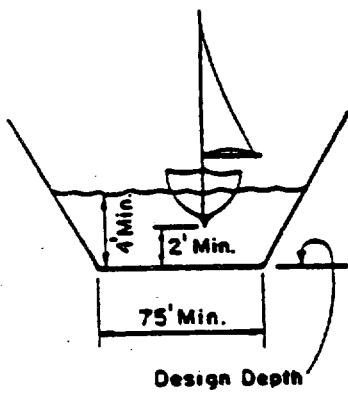
II-Design Criteria

A. WATER AREAS



1. CHANNELS - ENTRANCE

- Minimum Width: 75 ft. at design depth.
- Minimum Depth: 3 ft. below deepest draft vessel anticipated to be berthed in harbor, or 5 ft., whichever is greater. Design depths shall consider anticipated wave action and rate of siltation.

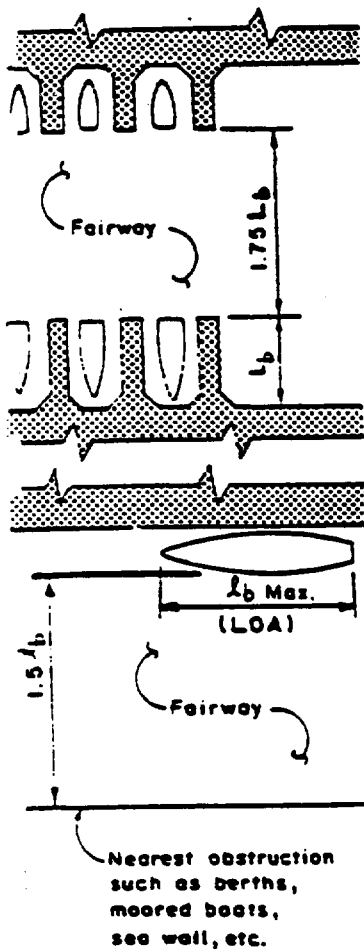


2. CHANNELS - INTERIOR

- Minimum Width: 75 ft. at design depth.
- Minimum Depth: 2 ft. below deepest draft vessel anticipated to be berthed in harbor, or 4 ft., whichever is greater.

3. FAIRWAYS

a. Minimum Width:



- 1.75 times length of longest berth where berths are perpendicular to the fairway.

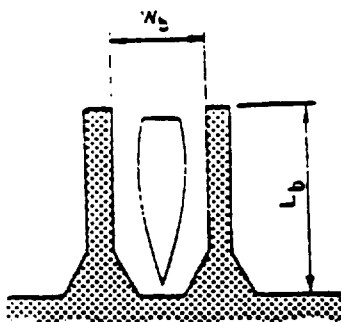
L_b = length of fingerfloat

- 1.50 times length of longest boat where boats are berthed parallel to the fairway.

L_b = length of boat (LOA)

b. Minimum Depths:

Berth Length	Minimum Depth	
	Power	Sail
up to 45'	6'	6'
55'	8'	3'
65'	8'	10'



Single Berth

Example: for a single powerboat berth 54' long:
 $W_b = 8 \ln 54 - 14$
 $= 8 \times 3.99 - 14$
 $= 17.9'$

Example: for a single sailboat berth 54' long:
 $W_b = \frac{54}{5} + 5.5 - (54 - 40) \cdot 0.075$
 $= 10.8 + 5.5 - 1.05$
 $= 15.3'$

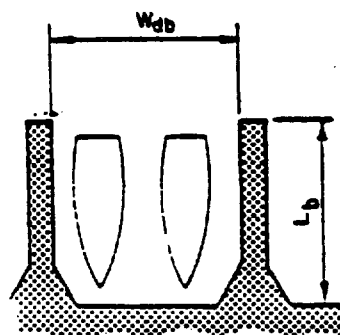
4. BERTHS - SINGLE

- Minimum water depth: Same as for fairways
- Minimum width: L_b = length of berth (fingerfloat)

W_b = width of berth
 = beam of boat @ waterline + 2 ft.

	POWERBOATS	SAILBOATS
Recommended for Design Work	$W_b = 8 \ln L_b - 14'$	$W_b = 6.5 \ln L_b - 10.5'$
Recommended for Preliminary Layout and Planning Work	$W_b = \frac{L_b}{4} + 6' - R_p$ $R_p = 0.1$ ft. for each foot of berth length over 40 feet.	$W_b = \frac{L_b}{5} + 5.5' - R_s$ $R_s = 0.075$ ft. for each foot of berth length over 40 feet.

Note: See Page 5 for table of recommended berth widths.



Double Berth

5. BERTHS - DOUBLE

- Minimum water depth: same as fairways and singles.
- Minimum width:

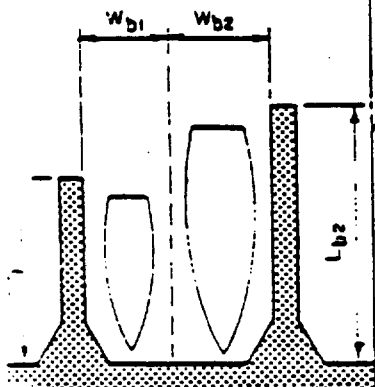
W_{db} = width of double berth (ft)

$$W_{db} = W_b \times 2 \text{ (see 4b above)}$$

- Where double berths consist of two berths of different lengths, the double berth width (W_{db}) will be equal to the sum of the two single berth widths:

$$W_{db} = W_{b1} + W_{b2}$$

- Where it is desired to convert a double berth into two single berths by installing a fingerfloat down the center, additional width must be provided for the fingerfloat. Encroachment upon the berthing space will not be permitted.



Double Berth
(different lengths)

TABLE I
RECOMMENDED SINGLE BERTH WIDTHS*

Berth Length (Feet)	ln L	POWERBOATS		SAILBOATS	
		$W_D = 8 \ln L - 14$ ** (Feet)	Recommended Widths *** (Feet)	$W_D = 6.5 \ln L - 10.5$ ** (Feet)	Recommended Widths *** (Feet)
16	2.77	8.2	8.5	7.5	7.5
18	2.89	9.1	9.5	8.3	8.5
20	3.00	10.0	10.0	9.0	9.0
22	3.09	10.7	11.0	9.6	10.0
24	3.18	11.4	11.5	10.2	10.5
26	3.26	12.1	12.5	10.7	11.0
28	3.33	12.7	13.0	11.2	11.5
30	3.40	13.2	13.5	11.6	12.0
32	3.47	13.7	14.0	12.0	12.0
34	3.53	14.2	14.5	12.4	12.5
36	3.58	14.7	15.0	12.8	13.0
38	3.64	15.1	15.5	13.1	13.5
40	3.69	15.5	15.5	13.5	13.5
42	3.74	15.9	16.0	13.8	14.0
44	3.78	16.3	16.5	14.1	14.5
46	3.83	16.6	17.0	14.4	14.5
48	3.87	17.0	17.0	14.7	15.0
50	3.91	17.3	17.5	14.9	15.0
52	3.95	17.6	18.0	15.2	15.5
54	3.99	17.9	18.0	15.4	15.5
56	4.03	18.2	18.5	15.7	16.0
58	4.06	18.5	18.5	15.9	16.0
60	4.09	18.8	19.0	16.1	16.5
62	4.13	19.0	19.0	16.3	16.5
64	4.16	19.3	19.5	16.5	16.5
66	4.19	19.5	19.5	16.7	17.0
68	4.22	19.8	20.0	16.9	17.0
70	4.25	20.0	20.0	17.1	17.5
72	4.28	20.2	20.5	17.3	17.5
74	4.30	20.4	20.5	17.5	17.5
76	4.33	20.6	21.0	17.6	18.0
78	4.36	20.9	21.0	17.8	18.0
80	4.38	21.1	21.5	18.0	18.0

* For double berth widths, multiply by two.

** These equations were developed by Cal Boating on an empirical basis via field observation and measurements, and review of boat manufacturers specifications on length and beam of power and sailboats typically found in California marinas and harbors.

*** Recommended widths are rounded "up" to the nearest half foot.

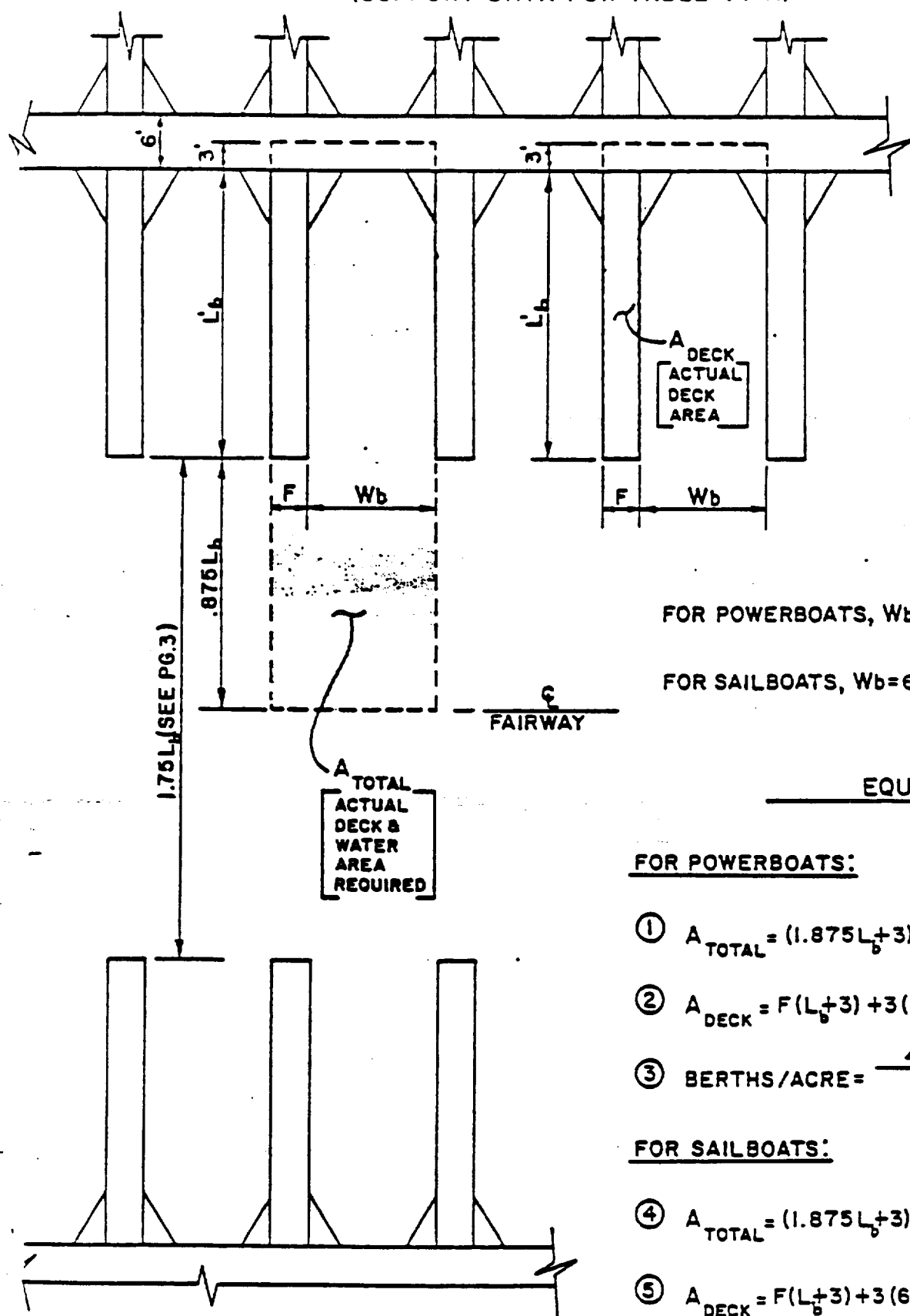
Note: To convert feet to meters, multiply by 0.3048.

TABLE II-A
BERTHING LAYOUT PLANNING DATA FOR SINGLE BERTHS

Fingerfloat Width (Feet)	"L _B " Length of Berth (Feet)	POWERBOATS			SAILBOATS		
		①	②	③	④	⑤	⑥
		Total Berth Area (Ft ²)	Actual Deck Area (Ft ²)	Berths per Acre	Total Berth Area (Ft ²)	Actual Deck Area (Ft ²)	Berths per Acre
F = 2.5'							
	16	352.5	71.0	123.6	330.7	70.1	131.7
	18	427.1	79.9	102.0	396.4	77.4	109.9
	20	504.9	87.4	86.3	464.6	84.4	93.6
F = 3.0'							
	22	607.5	107.2	71.7	557.2	103.8	78.2
	24	692.4	115.3	62.9	631.6	111.5	69.0
	26	779.6	123.2	55.9	707.8	119.0	61.5
	28	869.0	131.0	50.1	785.8	126.5	55.4
	30	960.4	138.6	45.4	865.5	133.8	50.3
	32	1053.7	146.2	41.3	946.7	141.1	46.0
	34	1148.8	153.6	37.9	1029.4	148.3	42.3
F = 4.0'							
	36	1316.1	200.0	33.1	1183.9	194.4	36.8
	38	1418.2	209.3	30.7	1273.0	203.4	34.2
	40	1521.9	218.5	28.6	1363.3	212.4	32.0
	42	1626.9	227.7	26.8	1454.7	221.4	29.9
	44	1733.4	236.8	25.1	1547.3	230.3	28.2
	46	1841.1	245.9	23.7	1641.0	239.2	26.5
	48	1950.2	254.9	22.3	1735.6	248.0	25.1
	50	2060.4	263.9	21.1	1831.3	256.8	23.8
	52	2171.8	272.8	20.1	1927.9	265.5	22.6
	54	2284.3	281.7	19.1	2025.4	274.3	21.5
	56	2397.9	290.6	18.2	2123.8	283.0	20.5
	58	2512.5	299.5	17.3	2223.0	291.7	19.6
	60	2628.2	308.3	16.6	2323.1	300.3	18.8
F = 5.0'							
	62	2864.0	382.1	15.2	2543.2	374.0	17.1
	64	2985.3	392.3	14.6	2648.5	384.6	16.4
	66	3107.6	403.6	14.0	2754.6	395.2	15.8
	68	3230.7	414.3	13.5	2861.4	405.3	15.2
	70	3354.6	425.0	13.0	2969.0	416.3	14.7
	72	3479.4	435.6	12.5	3077.2	426.9	14.2
	74	3605.1	446.3	12.1	3186.0	437.4	13.7
	76	3731.5	456.9	11.7	3295.5	447.9	13.2
	78	3858.7	467.6	11.3	3405.7	458.3	12.8
	80	3986.6	478.2	10.9	3516.4	468.9	12.4

Note: Numbers in circles refer to equations on page 7.

TABLE 11-B
(SUPPORT DATA FOR TABLE 11-A)



MINIMUM
VALUES FOR "F"
(SEE PAGE 12)

L	F
UP TO 20'	2.5'
21' TO 35'	3.0'
36' TO 60'	4.0'
61' & UP	5.0'

FOR POWERBOATS, $W_b = 8 \ln L_b - 14$

FOR SAILBOATS, $W_b = 6.5 \ln L_b - 10.5$

SEE PG. 5

EQUATIONS

FOR POWERBOATS:

$$\textcircled{1} \quad A_{\text{TOTAL}} = (1.875 L_b + 3)(F + 8 \ln L_b - 14)$$

$$\textcircled{2} \quad A_{\text{DECK}} = F(L_b + 3) + 3(8 \ln L_b - 14)$$

$$\textcircled{3} \quad \text{BERTHS/ACRE} = \frac{43560}{\textcircled{1}}$$

FOR SAILBOATS:

$$\textcircled{4} \quad A_{\text{TOTAL}} = (1.875 L_b + 3)(F + 6.5 \ln L_b - 10.5)$$

$$\textcircled{5} \quad A_{\text{DECK}} = F(L_b + 3) + 3(6.5 \ln L_b - 10.5)$$

$$\textcircled{6} \quad \text{BERTHS/ACRE} = \frac{43560}{\textcircled{4}}$$

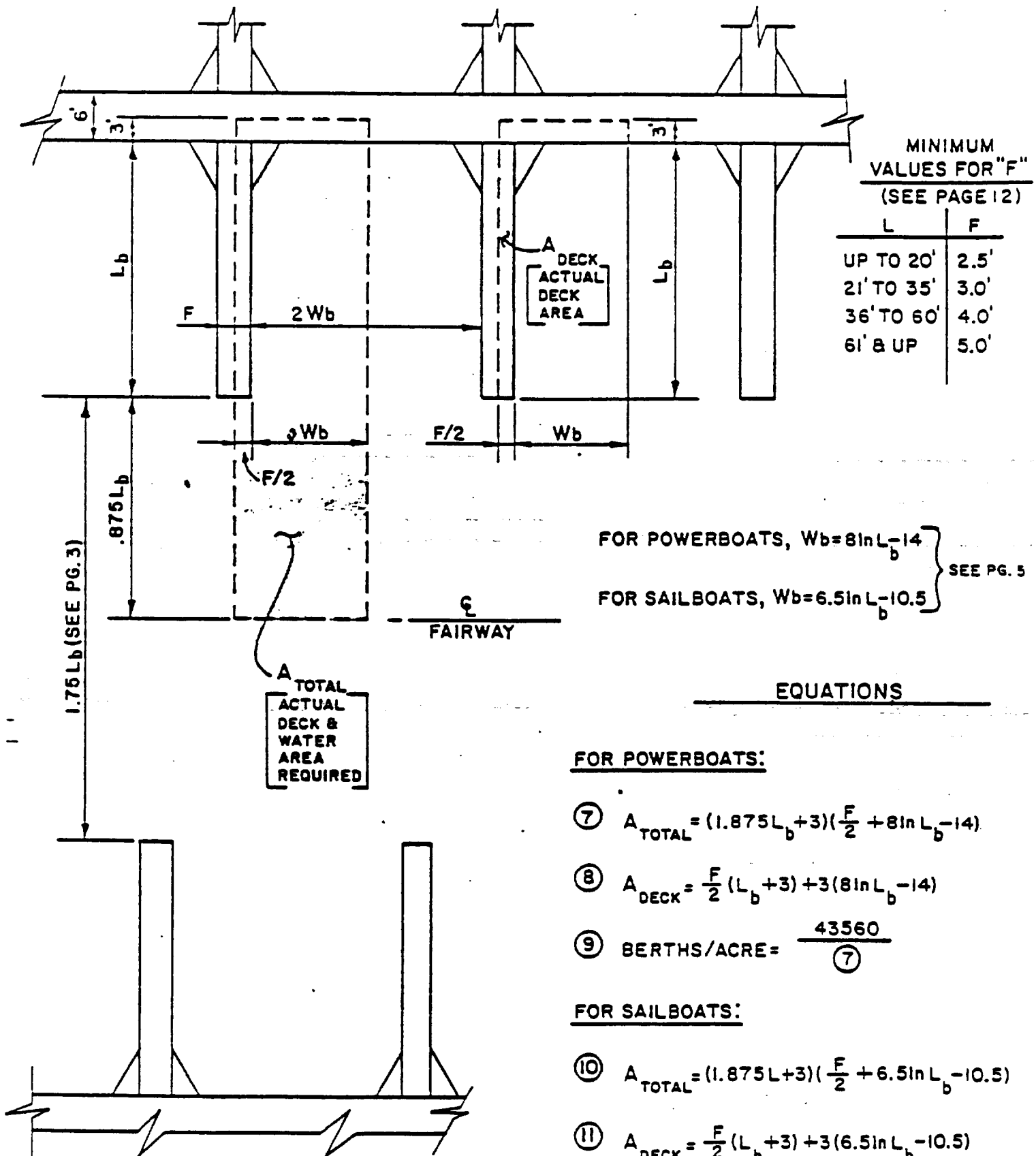
NOTE: The equations are based on the assumption that main walkways are 6 feet wide (see pg. 12)

TABLE III-A
BERTHING LAYOUT PLANNING DATA FOR DOUBLE BERTHS

Fingerfloat Width (Feet)	Length of Berth (Feet)	POWERBOATS			SAILBOATS		
		⑦	⑧	⑨	⑩	⑪	⑫
		Total Berth Area (Ft ²)	Actual Deck Area (Ft ²)	Berths per Acre	Total Berth Area (Ft ²)	Actual Deck Area (Ft ²)	Berths per Acre
F = 2.5'							
	16	311.2	48.3	140.0	289.5	46.3	150.3
	18	381.2	53.6	114.3	350.5	51.1	124.3
	20	454.2	58.6	95.9	414.0	55.7	105.3
F = 3.0'							
	22	541.1	69.7	80.5	490.8	66.3	88.3
	24	620.4	74.8	70.2	559.6	71.0	77.8
	26	702.0	79.7	62.1	630.2	75.5	69.1
	28	785.7	84.5	55.4	702.6	80.0	62.0
	30	871.5	89.1	50.0	776.6	84.3	56.1
	32	959.2	93.7	45.4	852.2	88.6	51.1
	34	1048.7	98.1	41.5	929.2	92.8	46.9
F = 4.0'							
	36	1175.1	122.0	37.1	1042.9	116.4	41.8
	38	1269.7	127.3	34.3	1124.5	121.4	38.7
	40	1365.9	132.5	31.9	1207.3	126.4	36.1
	42	1463.4	137.7	29.8	1291.2	131.4	33.7
	44	1562.4	142.8	27.9	1376.3	136.3	31.6
	46	1662.6	147.9	26.2	1462.5	141.2	29.3
	48	1764.2	152.9	24.7	1549.6	146.0	28.1
	50	1866.9	157.9	23.3	1637.8	150.8	26.6
	52	1970.8	162.8	22.1	1726.9	155.5	25.2
	54	2075.8	167.7	21.0	1816.9	160.3	24.0
	56	2181.9	172.6	20.0	1907.8	165.0	22.8
	58	2289.0	177.5	19.0	1999.5	169.7	21.3
	60	2397.2	182.3	18.2	2092.1	174.3	20.2
F = 5.0'							
	62	2565.9	219.6	17.0	2245.0	211.5	19.4
	64	2677.3	225.3	16.3	2341.0	217.1	18.6
	66	2790.7	231.1	15.6	2437.8	222.7	17.9
	68	2904.4	236.3	15.0	2535.2	228.3	17.2
	70	3019.0	242.5	14.4	2633.3	233.8	16.5
	72	3134.4	248.1	13.9	2732.2	239.4	15.9
	74	3250.7	253.3	13.4	2831.7	244.9	15.4
	76	3367.7	259.4	12.9	2931.3	250.4	14.9
	78	3485.3	265.1	12.5	3032.6	256.0	14.4
	80	3604.1	270.7	12.1	3133.9	261.4	13.9

Note: Numbers in circles refer to equations on page 2.

TABLE III-B
(SUPPORT DATA FOR TABLE III - A)



NOTE: The equations are based on the assumption that main walkways are 6 feet wide (see pg. 12)

3. LAND AREAS

1. PARKING

a. Minimum requirements:

0.60 parking spaces/recreational boat berth

2.00 parking spaces/commercial fishing boat berth

b. The minimum parking described above shall be in addition to parking needs for special use areas such as restaurants and other concessions, public fishing piers, launching ramps, etc.

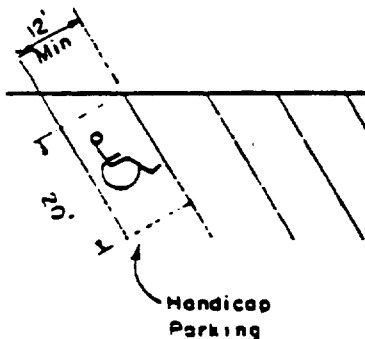
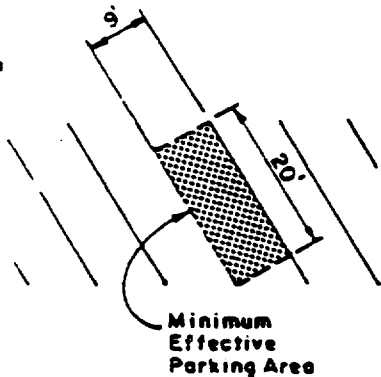
c. Parking areas shall be located reasonably adjacent to the berthing areas they serve. Although it is sometimes physically impossible to do so, efforts should be made to provide parking no further than 1,000 feet (walking distance) from any given berth.

d. Large visual expanses of asphalt paving are to be avoided through the use of appropriately placed planter islands and planter strips. These planter areas should also be used as a primary means of directing and controlling traffic flow.

e. Finish parking lot grades shall be a minimum of 1%. Every effort shall be made to hold the maximum grade to 5%. No parking areas will be permitted with grades in excess of 10%.

f. Marina parking spaces shall be a minimum of 9' x 20'.

g. Approximately 2% (but no less than one space) of the parking spaces shall be set aside and identified for use by individuals with physical disabilities. These parking spaces shall be convenient to the main marina facilities, shall be no less than 12 ft. wide, and located in such a way that persons using wheelchairs, braces, or crutches are not compelled to wheel or walk behind parked cars. Wheelchair ramps shall be provided wherever necessary to cross curbs and other obstructions.



2. SANITARY FACILITIES

- a. Sanitary facilities shall be located as convenient to the berths as practicable. The maximum distance from any berth to the nearest restroom should not exceed 600 ft. and shall not exceed 1,000 ft. (walking distance).
- b. The architectural design of such facilities shall be compatible with the surrounding area and existing structures.
- c. The sanitary facilities shall meet the public health requirements of local, state, and federal agencies within whose jurisdiction they are to be built.
- d. The number of toilet fixtures required for a given marina will have to be determined on the basis of the particular needs at a specific site. However, a general rule-of-thumb is one toilet fixture and one lavatory per sex for every 75 berths.
- e. Toilets shall be low volume flush type units with a maximum water use of 3.5 gallons per flush.
- f. Trash receptacles shall be provided at all gangways, restrooms, and elsewhere as required.
- g. Restrooms shall be designed to meet all requirements for access to and use by paraplegics.

3. LAUNCHING RAMP

- a. Where a launching ramp is included within a marina project, it shall be located so as to minimize interference with boat traffic to and from berthing areas.
- b. Launching ramps shall be designed and constructed in accordance with Cal Boating Launching Facilities Guidelines. Copies are available by calling 916-445-9657, or writing to:

Department of Boating and Waterways
Boating Facilities Division
1629 S Street
Sacramento, California 95814

C. FLOATING STRUCTURES

1. DIMENSIONS

a. Marginal Walkways

- (1) When serving main walkways which do not have individual gangways, the minimum unobstructed width shall be 8 ft.

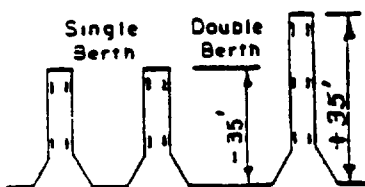
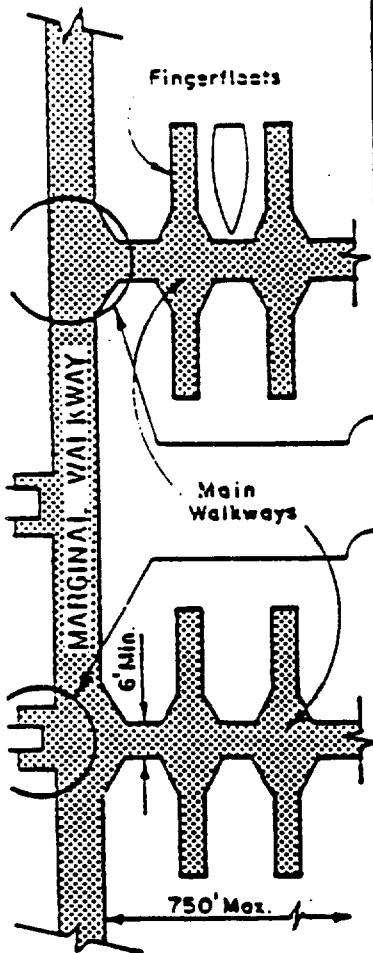
- (2) When serving main walkways which have individual gangways, the minimum width shall be 6 ft.

b. Main Walkways

- (1) Minimum unobstructed width shall be 6 ft.
- (2) Maximum length shall be 750 ft.

c. Fingerfloats

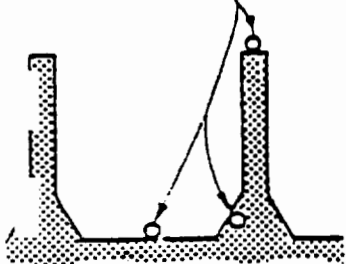
- (1) For berths up to 20 ft. long, the minimum width shall be 2.5 ft.
- (2) For berths between 21 and 35 ft. long, the minimum width shall be 3 ft.
- (3) For berths between 36 and 60 ft. long, the minimum width shall be 4 ft.
- (4) For berths longer than 60 ft., the minimum width shall be 5 ft.
- (5) Tie-down cleats shall be provided as required. However, not less than two (2) cleats shall be provided on all fingerfloats up to 35 feet long, and not less than three (3) cleats on fingerfloats over 35 feet. One (1) cleat per berth shall be provided on the main walkway on double berths.



Typical Cleat Arrangements

d. Piles

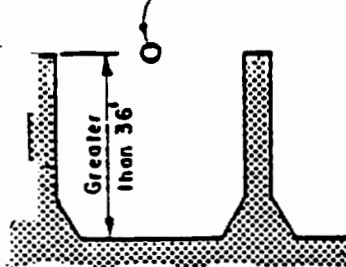
Typical Locations
for Guide Piles



- (1) Sufficient numbers of guide piles shall be installed to permanently maintain position and location of floating structures, and to resist lateral loads resulting from wind, wave, current, and impact forces. Design consideration shall be given to the maximum combination of forces that can occur at a given site.

- (2) Guide Piles shall be placed at the ends of all fingerfloats that are adjacent to channels.

Mooring
Pile



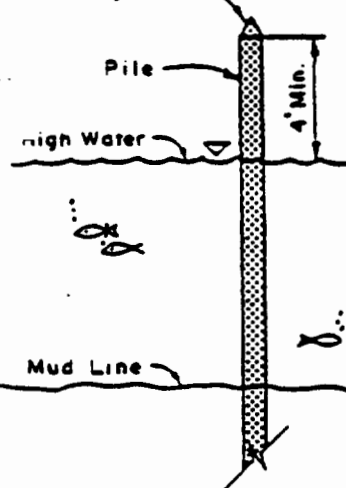
- (3) Mooring piles may be provided in all double berths that exceed 36 ft. in length.

Comment: These mooring piles precipitate a variety of responses from boaters. Some use them to good advantage while others say they are in the way and should not be installed. The decision to install such piles should be tempered by considerations of the type of boats to be berthed, and by the needs, habits and opinions of the potential users.

An inexpensive improvement to such mooring piles is a foam-filled auto tire or small truck tire, dropped down over the pile. It floats in the water, moves up and down with the tide, and provides a long wearing protective bumper for both the boat and the pile.

Cone or
Pyramid

Pile



- (4) The cut-off point for all guide and mooring piles shall be not less than 4 ft. above maximum high water.

Note: Great care must be exercised in the determination of cut-off elevations for these piles. In marina basins subject to surge, storm waves, sudden large inflow of storm water (in rivers for example) and other locations where water levels can periodically be in excess of high tide levels, pile cut-off elevations may have to be as much as 6 or 8 feet above normal high water.

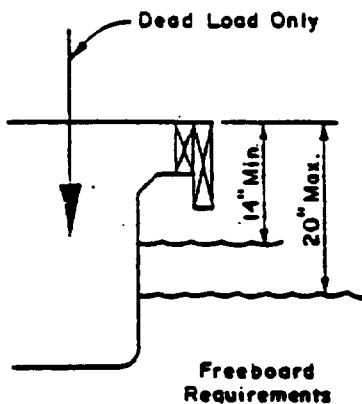
- (5) All piles shall be capped with cones, pyramids or other appropriate devices to prevent the roosting of birds.

- (c) Where concrete piles are to be used, common sections are square, octagonal, and round. Square piles are the least expensive, but frequently rotate during driving and present an unattractive appearance. Round piles are the most attractive, but are more expensive, and can cause problems with "flat" guide-roller hardware bearing on a round surface. The octagonal pile offers a good combination between the square and round pile in that it appears round from a distance but still provides flat bearing surfaces for roller-guides.

2. LOADING

a. Dead Loads

- (1) The weights of all framing, decking, connections, flotation units, and all permanently attached equipment such as pipes, pumps, utilities, fire fighting equipment, gangways, etc., shall be included as dead loads.
- (2) The weight of lumber shall be assumed to be a minimum of 35 lbs. per cubic ft.
- (3) Freeboard under dead loading only shall be a minimum of 14 inches and a maximum of 20 inches, and shall be sufficient to prevent walers and/or waler-hung utility lines from coming into direct contact with the water.

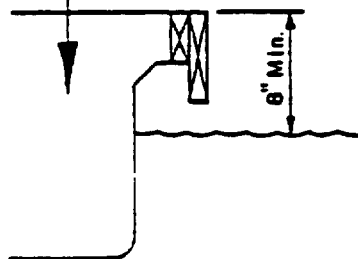


b. Live Loads

- (1) Sufficient flotation shall be provided to support a uniform live load of 20 lbs. per sq. ft., or a concentrated load of 400 lbs. These design loads need not be applied simultaneously.

Comment: In cases where it is necessary to provide docks in exposed, rough water locations, highly flexible float systems such as thin-deck laminated wood systems are desirable and work well. However, a 20 #/ft^2 live load will require pontoons to the extent that they will effectively "stiffen" the system and diminish its flexibility. Therefore, 12 #/ft^2 live load is recommended in such cases. This is for exceptional applications and is not recommended for marinas in general.

Dead and Live Loads Combined



- (2) If the width of a floating structure exceeds the minimum widths specified on page 11, the uniform live load may be reduced as follows:

$$L.L. = 20 - 3 \left[\frac{\text{Actual Width}}{\text{Minimum Width}} - 1 \right]$$

In no case, however, shall the live load be reduced to less than 12 lbs. per sq. ft.

- (3) Freeboard under dead and full live load combined shall not be less than 8 inches.

Note: At locations where live loads are transmitted from gangway to floating structures, said live loads may be calculated on the basis of 20#/ft² (applied concurrently with 20#/ft² on the floating structure) rather than the 40# used for gangway design (see Gangways, page 18). To use the larger live loading value for such temporary gangway loads will usually require floatation at gangways in such quantities that the floating structure may ride too high in the water under "normal" use.

c. Lateral Loads

- (1) Wind loads on projected areas of boats in the slips of structures on the floats shall be not less than 15 lb. per sq. ft.
- (2) Current loadings shall be calculated on the basis of maximum current anticipated in harbor.
- (3) Loadings due to waves shall be calculated on the basis of the maximum possible wave that can be expected at the location of the structure, i.e., either caused by the highest significant wave impinging upon the protective works of the harbor or the maximum wind wave that can be set up within the harbor, whichever is greater.

Example, for a pleasure boat:

$$L = 40'$$

$$V = 2 \text{ fps}$$

$$\begin{aligned} W &= 12 L^2 \\ &= 12 (40)^2 \\ &= 19,200 \end{aligned}$$

$$\begin{aligned} K.E. &= \frac{1}{2} \frac{Wv^2}{g} \\ &= \frac{1}{2} \frac{(19,200)(2)^2}{32.2} \\ &= 1192 \text{ ft.}\cdot\text{#} \end{aligned}$$

- (4) Impact loads shall be based upon the length and weight of a boat, and its velocity at impact. The following should be considered as minimum values, and should be adjusted upward by the designer as is appropriate to meet particular circumstances.

$$\text{Impact} = K.E. \text{ (Kinetic Energy)} = \frac{1}{2} \frac{Wv^2}{g} \text{ (ft.}\cdot\text{#)}$$

$$\text{Where: } g = 32.2 \text{ ft./sec}^2$$

v = velocity of boat (ft./sec)
(shall be assumed at not less than 1 ft/sec)

W = weight of boat (#)

For pleasure boats:

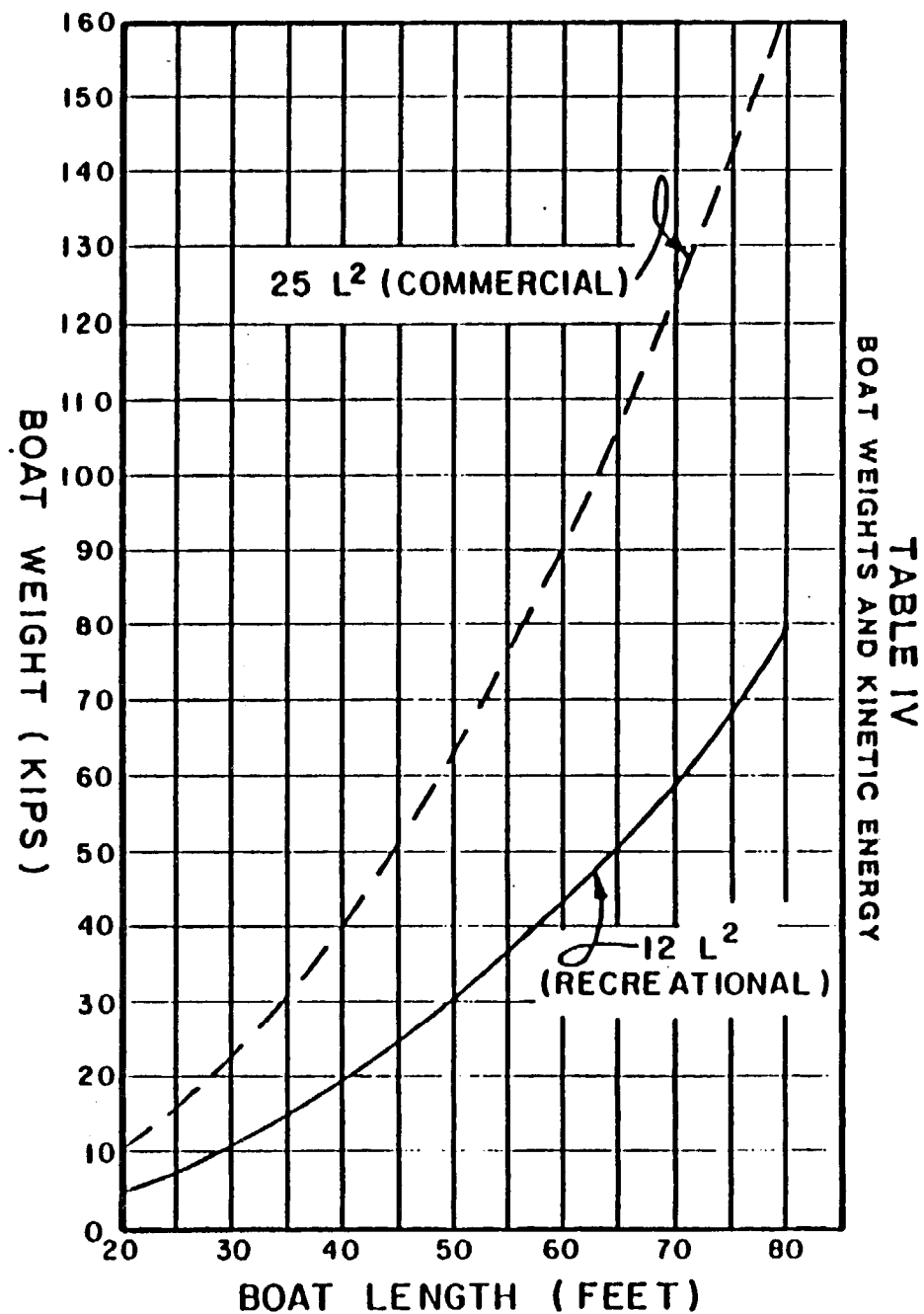
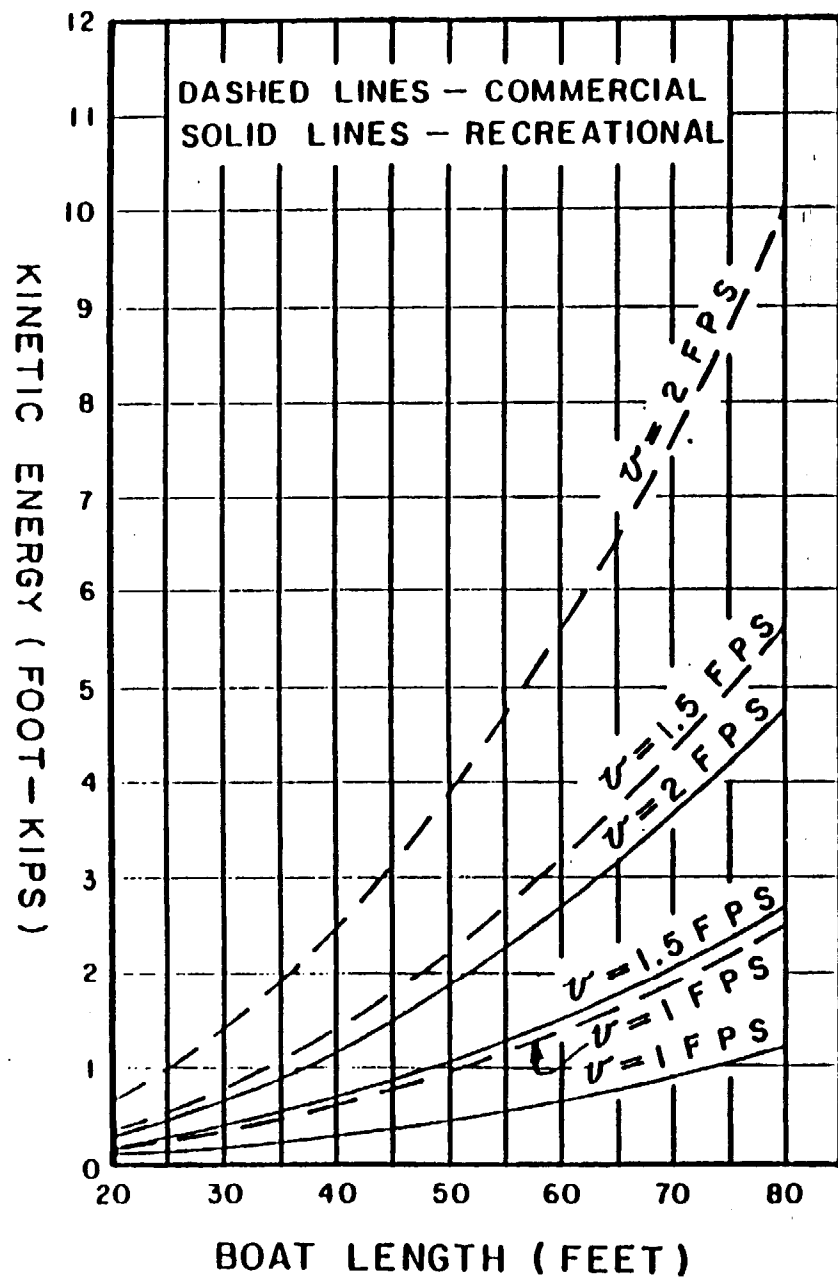
$$W_{\min} = 12 L^2$$

For commercial boats:

$$W_{\min} = 25 L^2$$

Where L = length (LCR) of boat (ft.)

(See Page 16 for sketch of boat weights)



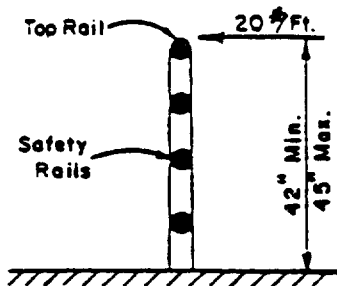
D. SHORE STRUCTURES

1. PIERS

- a. Piers used only for pedestrian access to floating structures shall be designed to support their own dead load and a minimum live load of 40 lbs. per sq. ft.
- b. Piers upon which a vehicle may be driven shall be designed for not less than H10-44 loading as specified in AASHTO Standard Specifications for Highway Bridges.

Note: H10-44 specifies a 20,000# truck

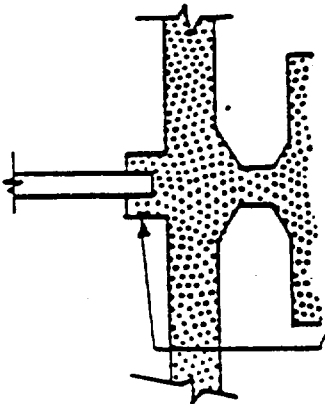
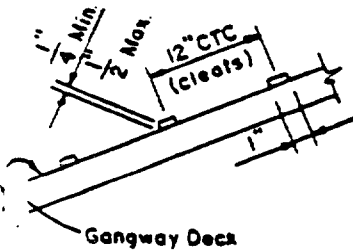
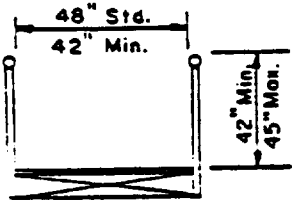
Front axle - 4,000#
Rear axle - 16,000#
Wheel Base - 14 feet



- c. All piers shall have railings capable of withstanding a horizontal force of twenty (20) pounds per lineal foot applied at the top of railing. The top rail shall be not less than 42 inches nor more than 45 inches in height.

2. GANGWAYS (BROWS)

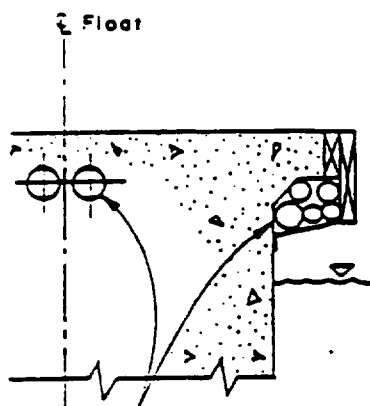
- a. Gangways shall be designed to support a minimum live load of 40 lbs. per sq. ft.
- b. Handrails shall be designed to withstand a minimum live load of 20#/ft applied horizontally to the top rail which shall be not less than 42 inches nor more than 45 inches in height.
- c. The live load transmitted from a gangway to a floating structure may be calculated on the basis of a 20 lb. per sq. ft. minimum live load applied to the total surface area of the gangway.
- d. Gangway widths are typically 48" clear between railings. The need for widths larger or smaller than 48" shall be determined by the designer, but in no case shall the clear width of a gangway be less than 42".
- e. Gangway decks shall be covered with a non-skid surface material, and/or cleats shall be attached to the deck on 12" centers. Cleats shall be 1" wide and not less than 1/4" nor more than 1/2" high.
- f. Maximum gangway slopes:
 - (1) Coastal waters
3:1 max slope @ 0.0 MLLW or higher.
2 1/2:1 max slope below 0.0 MLLW.
 - (2) Inland waters
3:1 max slope not less than 90% of time.
2 1/2:1 max slope not more than 10% of time.
- g. Where the lower end of a gangway is supported on a marginal walkway or main walkway, additional walkway width, landing platform, or other provision must be made to insure that the gangway does not encroach upon the minimum unobstructed width of such walkways as required by these guidelines.
- h. Toe plates shall be provided at the lower end of gangways, slope not to exceed maximum gangway slope.



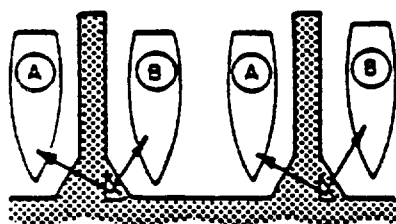
E. SPECIAL SERVICES

1. UTILITIES

- a. General
 - (1) All shoreside utilities shall be underground.
 - (2) Utility sizing, location, design and construction shall conform to accepted practice and all applicable codes.



Typical locations for utilities (case shown is for concrete floats.)



Typical Water Service Arrangement for Double Berths.

NOTE:

Experience has shown that although boats in position "A" must be serviced via their own water line which must lay across the fingerfloat, this slight inconvenience is considered justified in consideration of the increased costs necessary to provide water service on each side of every fingerfloat. Same thing applies to the electrical service.

- (3) All utility lines on floating structures shall be installed so as to provide maximum protection from the elements, and mechanical wear and damage.
- (4) No utility lines shall be attached to the top of the deck on floating structures.
- (5) No utility lines, conduits, pull boxes, and/or other parts of the utility system shall be installed with less than 6 inches of clearance above the waterline under dead load conditions, nor less than 2 inches clearance under dead plus live load conditions.

b. Water Service

- (1) All water lines on floating structures shall be equipped at the shore end with appropriate anti-siphon devices.
- (2) One (1) standard 3/4 inch hose bibb shall be provided for every two (2) berths and deliver potable water at not less than 40 psi.
- (3) Fire protection hoses and reels shall be provided in sufficient locations to afford protection to all floating structures and boats in the marina at the rate of not less than 40 gal. per minute at 40 psi. A typical installation consists of the placement of a firehose cabinet at 150 foot intervals along marina walkways, each with a hand-operated valve, 75 feet of firehose, and a nozzle.

This level of fire protection is generally understood to be "first aid" fire fighting capability. Marina designers should check with local fire officials and make appropriate provisions for major fire fighting capability in accordance with specific needs at specific sites.

2. Electrical Service

- (1) All electrical service on floating structures shall conform to Article 5555 Title 24 of the State Building Standards, as well as all local codes. Where conflicts occur, the more conservative code shall be used. (See Appendix A)
- (2) All berths shall be provided with not less than one (1) 120 volt 30 amp outlet. Additional power requirements should be considered as required by demonstrated need.
- (3) It is recommended that circuit breakers equipped with ground fault interrupters (GFI's) be provided at all berth power outlets.

Comment: If GFI's are installed, marina staff must institute a well planned, managed, and supervised program of testing and maintenance at regular intervals. If the boater is to rely upon these safety devices, care must be exercised to insure that the devices remain in reliable working condition, particularly in salt water environments. Regular testing should consist of the use of a testing instrument which (1) applies a ground fault current and (2) measures the interval in milliseconds from the time the fault current is applied until the GFI actually disconnects the circuit. The standard fault current is 5 milliamps with the trip time varying with the GFI manufacturer's specifications.

NOTE:

See sketch and note (page 19) on water service lines.

- (4) Where two adjacent berths are served by electrical outlets physically located in a common utility box, the utility box shall be located between the berths in such a way that extension cables will not cross the main walkways. (Fingerfloats are not main walkways!)
- (5) Where lighting is provided on floating structures, the lighting circuits shall be separate from the berthing service circuits.
- (6) All lighting, both on floating structures and shoreside, shall be designed to minimize reflection on navigation channels and fairways.

2. SEWAGE PUMPOUT FACILITY

- a. A minimum of one (1) shoreside pumpout installation shall be provided at every marina.
- b. Shoreside pumpout facilities shall include equipment to pump or otherwise receive and transfer contents of vessel holding tanks into a sewage retention and/or disposal system approved by the local authority having jurisdiction, and such system shall meet waste discharge requirements established by the appropriate regional water quality control board.
- c. A fresh water pressure line and hose shall be provided to flush out boat holding tanks. Such water line and hose shall be clearly marked and/or otherwise identified as NOT FIT FOR HUMAN CONSUMPTION. No potable water supply shall be provided on or adjacent to the sewage pumpout facility.

3. FUEL FLOAT

- a. All fuel installations shall be designed to prevent fuel spillage, and shall be provided with spark protection safety equipment.
- b. Fuel storage tanks shall be located underground above the high water line.
- c. The fuel float shall be located within the marina in such a way that boaters have ready access to and from the facility with minimum travel through berthing areas.
- d. The fuel float shall be a separate floating structure from the berths and shall be isolated to the extent that fire or explosion would have minimal opportunity to spread from fuel float to berths or vice versa.
- e. Under normal conditions, it is advantageous to have the fuel pumps and the sewage pumpout station located adjacent to each other on the same floating structure.
- f. All flotation material used in and adjacent to the fuel float shall be highly resistant to hydrocarbons. The use of unprotected polystyrene for fuel float construction is specifically prohibited.

Appendix A

TITLE 24 Basic Electrical Regulations
(Register 70, No. 15--4-11-70)

Article E555. Boat Docking and Harbor Wiring

The provisions of this Article shall apply to the installation of conductors and equipment for boat docks.

E555-1. Outlets. Where a receptacle to supply a boat is installed it shall provide a minimum of 20 amperes for each craft.

(a) Where boats are supplied from circuits with receptacle larger than 20 amperes rating, 80% of the ampere rating of the receptacle at the supply voltage shall be considered the load to be supplied.

(b) An individual branch circuit with conductors not smaller than No. 12 AWG shall supply each boat receptacle. Dock lighting shall be supplied from circuits which supply only such lighting or clocks.

Note: Authority cited: Sections 38, 71.2 and 82 of Div. 1, Harbors and Navigation Code and Sections 18900 through 18915, Health and Safety Code, Issuing agencies: Department of Boating and Waterways and State Building Standards Commission.

History: New Article (§ E 555-1 through E555-8) filed 4-7-70; effective thirtieth day thereafter (Register 70, No. 15).

E555-2. Branch Circuit and Feeder Calculations. Feeders and branch circuits which supply boats shall be sized to supply the amperes called for in E555-1. The minimum feeder conductor size shall be No. 10 AWG.

(a) A demand factor as shown in the following table may be applied to such feeders; and services:

Demand Factor Table

Number of Receptacles	Demand Factor
1 - 4 -----	1.0
5 - 8 -----	.90
9 - 13 -----	.80
14 - 18 -----	.70
19 - 23 -----	.60
24 - 30 -----	.50
31 and over -----	.40

(b) For voltage drop requirements, see section E215-3.

E555-3. Materials. All materials shall be of a type which will minimize the corrosive effects of the environment, and shall be suitable for marine usage.

(a) General use metallic materials other than conductors and devices shall be corrosion resistant.

(b) Plastic materials used must be those which are suitable for use in wet locations, exposure to sunlight, and are resistant to the effects of ozone and altitude.

E555-4. Clearance over Water. Wiring, subject to the requirements of this Article E555, over navigable waterways shall be approved by the agency in charge of the specific waterway.

E555-5. Receptacles. Receptacles and matching plugs shall be of the grounding type and have ratings suitable for the purpose.

(a) Receptacles shall be installed so that water will drain away from the face of the device and not into the plug openings.

(b) Receptacles should be located so that the dropping of a plug will not allow it to accidentally fall into the water.

(c) Permanent markings shall be inscribed on or near receptacles which warn to the effect, "Do not insert plug into receptacle if it is wet."

Note: See ANS Standard C-73 for recommended configurations.

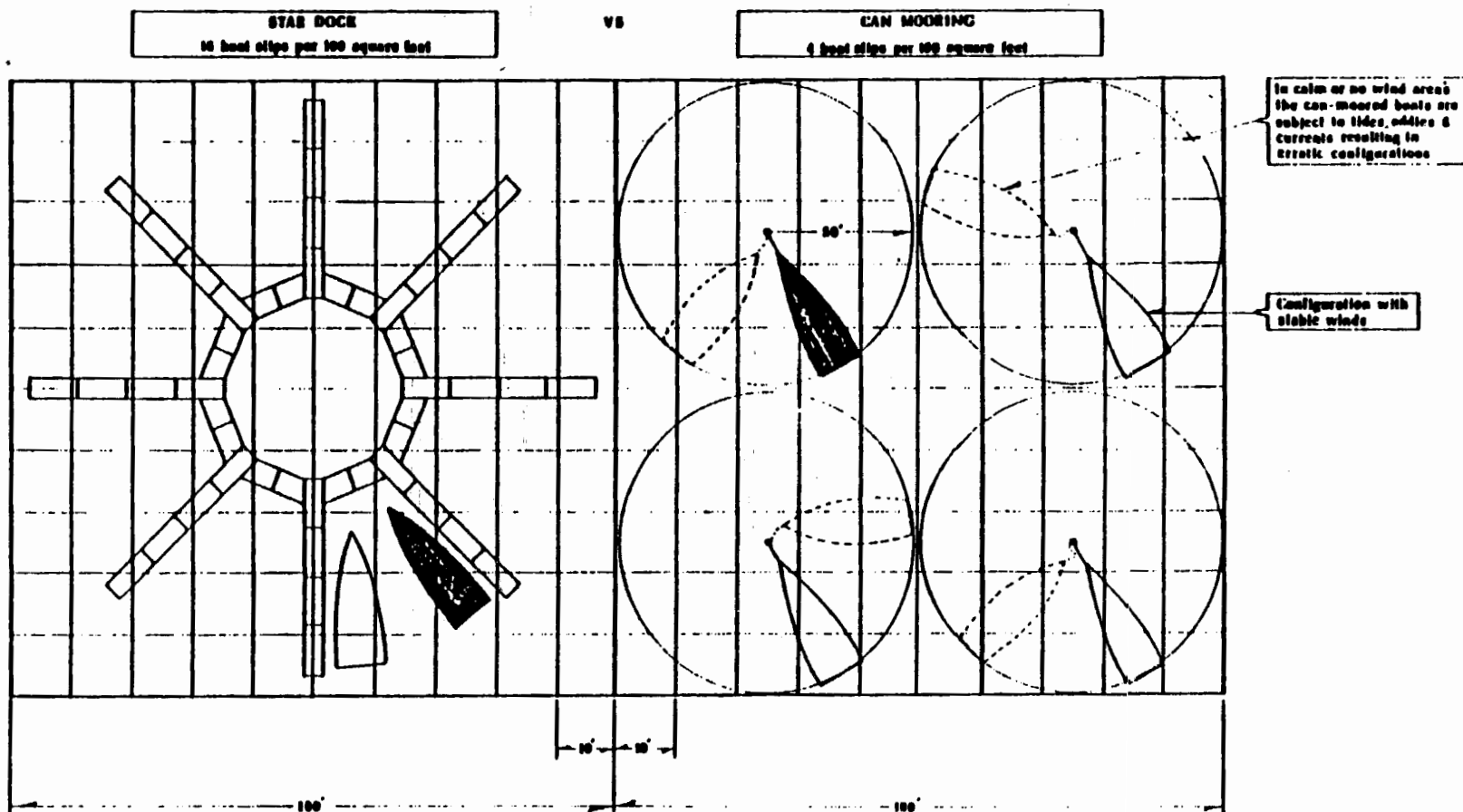
E555-6. Grounding. A separate grounding conductor shall be provided in each wiring enclosure, cable, or cord. The electrical continuity of this conductor shall be provided from the service entrance switch to each box, or cabinet, and a separate and special pole of each receptacle sized in accordance with Section E250-95, but not smaller than No. 12 AWG. The boat electrical system supplied from the dock receptacle must be grounded through the receptacle grounding pole.

E555-7. Cords. When cords are used, they shall be of a type which will be resistant to the effects of water, oil, ozone, smog, and sunlight.

(a) Devices used with cords shall be of the type which will prevent strain on the electrical connections.

E555-8. Flexible Connections. When floating sections of docks are used, means shall be provided for necessary flexure of the connecting sections.

(a) Where cord is used, it shall span only the hinge, and be suitably protected from physical damage.



DATE	APPROVED BY	DRAWN BY

APPENDIX H

REVIEW OF CALIFORNIA GUIDELINES FOR SMALL CRAFT BERTHING FACILITIES

February 5, 1986

Dear Sam:

I have reviewed the California "Guidelines for Small Craft Berthing Facilities" and it is excellent. There are some area that do not apply to Mamaroneck and this can be included in the following general disclaimer:

Notice to Applicant:

1. The attached "National Electrical Code", the California "Guidelines for Small Craft Berthing Facilities" and the University of Rhode Island "Alternative Marina Concepts" are to be considered as a general guide for the design of marinas, individual berthing facilities and marine structures. But each application will be considered on its individual merits.
2. All designs will be judged for their safety, ease of navigation and correct clearances from federal and local channels.
3. Fixed and floating structures will be judged for correct engineering designs as well as life-space and serviceability.

The electrical codes in the National Electrical Code for Marinas of Boatyards "with supplements and addendum are what I use for large marinas. But these could be excessive for smaller installations such as Mam'k Beach & Yatch or Orienta Apartments. However, they are very good. This could be taken care of by an additional disclaimer to the effect that all "Electric Services will be reviewed by the Village of Mamaroneck electrical inspector and must comply with design requirements and installations of same".

Sam:

With this approach, we can delete the following paragraphs to make the codes more applicable to Mamaroneck:

- (1) Delete Section B: Land Areas in total
- (2) Correct Sections E1b, E1c & E2 to read as follows:

E1b: Water Service (optional)
E1c: Electric Service (optional)
E2 : Sewage Pumpout Facility (optional)

APPENDIX I
LIST OF CONTACTS

Joseph Fraioli, Village of Mamaroneck, Village Manager

Kathryn Clarke, Chairman, Village of Mamaroneck Coastal Zone Management Commission

Denise Rodosevich, Connecticut Department of Environmental Protection, CZM

Mildred Warnecke, Village of Mamaroneck Environmental Consultant

J. Jay Mautner, Co-Chairman Village of Mamaroneck Harbor Commission

Sam Yasgur, Co-Chairman, Village of Mamaroneck Harbor Commission

Dan Natchez, Daniel S. Natchez and Associates, Inc.

Charles T. McCaffrey, Jr., New York State Coastal Zone Management

Robert Stapf, NYS Office of General Services, Bureau of Land Grants

William Slezak, U.S. Army Corps of Engineers, Navigation Section

Robert Galvin, Chairman, Village of Mamaroneck Planning Commission

Jim Mancusi, Village of Mamaroneck Harbor Master

Eric Alsmeyer, U.S. Army Corps of Engineers

Frank Fish, Village of Mamaroneck Planning Consultant

Joe Baker, American Aerial Scenes, Shea Road Pompey, NY

Captain of the Port, U.S. Coast Guard

Thomas Mohrman, Town of North Hempstead, Chairman - Parks and Recreation Commission

Robert McClean - NYS Office of General Services, Bureau of Land Utilization

James Economedis, NYS Department of Environmental Conservation

Jack Brewer, Post Road Boat Yard, Inc.

Donald Lane, Orienta Yacht Club

APPENDIX I
(Continued)

Chief Joseph Delbianco, Village of Mamaroneck Police Department

Lieutenant Henry Hopkinson, Village of Mamaroneck Police Department

Joseph Siciliano, Supervisor of Marine Facilities, Town of Greenwich,
CT

Mrs. O'Brien, Public Works Department, Town of Fairfield, CT

Kim Trottier, Parks Department, City of Stamford, CT

Virginia Toleska, Village Clerks' Office, Village of Port Chester, NY

Chet Smith, Assistant Harbor Master, City of New Rochelle, NY

Mike Mocciane, Department of Parks & Recreation, City of Norwalk, CT

Mrs. Watson, Deputy Director, Recreation Department, Town of Westport,
CT

Diane Deuternum, Mamaroneck Boats and Motors

Mr. Bernard Rosenshein, Mamaroneck Beach, Cabana Club

Connecticut Marina

Tom Forte, Village of Mamaroneck Building Inspector

Frank Thiede, Village of Mamaroneck Engineer

APPENDIX J

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