AN INVESTIGATION OF THE ISSUES
AND IMPLICATIONS OF FLOATING HOMES:
THE GREATER VANCOUVER REGION.

by

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(ABSTRACT)

Floating homes, as an option to traditional land based accommodation is a field of study characterized by a relative absences of readily available information or studies, either in published or unpublished format. Because of this, the basic level of knowledge pertaining to floating homes is extremely limited. In order to effectively deal with floating homes one must have a basic understanding of the floating home situation. In light of this information gap the scope of this thesis has been to investigate floating homes in broad terms thereby providing a reference base in a field where information has been diffused and piecemeal. While striving to remain general in nature in the analysis of floating homes this thesis does, however, deal in some detail with the main issues and implications surrounding floating homes as evidenced in localities where they are presently moored. In addition, this thesis also identifies and suggests basic planning criteria and considerations that should be taken into account when and if floating homes or floating home moorages are considered.

There are basically three main issues commonly expressed by local officials as causing the greatest concern over both existing and future floating homes locating along their shorelines. The first and most overriding problem
relates to the exercise of jurisdictional controls over floating homes. Unlike controls that can be exercised in the upland areas of municipalities, the majority of those waters bordering municipalities around the Lower Mainland are under the jurisdiction and administration of a number of Federal agencies. These include the National Harbours Board, the Fraser River Harbour Commissions and the North Fraser River Harbour Commission. The enforcement of municipal by-laws is tenuous if not impossible because of the supremacy of Federal powers.

Secondly, because of the anomalous position of floating homes, existing legislative devices are inadequate to procure revenue through conventional taxation procedures. Floating homes, for the purposes of taxation are not assessable. Local governments, nonetheless, take the position that as users of the local service infrastructure, floating home residents should contribute their fair share of taxes.

A third concern relates to the environmental aspects of floating homes. The major problem is that floating homes currently discharge untreated domestic wastes into the surrounding waters.

The general study area for this thesis was the Lower Mainland of British Columbia and specifically those areas and municipalities that have dealt with floating homes. Two methods of investigation were employed in this study. First, a review of pertinent literature related to floating
homes was undertaken. The second, and most beneficial information was obtained through numerous interviews with officials or experts at both local and senior government levels as well as with officials of groups promoting the water living concepts.

General conclusions drawn from this study indicate and suggest a number of optional strategies that can be developed and employed to manage and regulate floating homes and the associated problems. Strategies range from those that can be initiated at the local level utilizing existing powers, to others which require the involvement of and cooperation among various government agencies, to, finally, developing new enabling federal and provincial legislation.
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I would like at this time to extend my thanks and appreciation for the guidance and assistance given me by Dr. Henry Hightower and Mr. William Lane throughout the preparation of this thesis. I would also like to thank the many persons who gave freely of their time to provide me with a great deal of valuable information.

Finally, to my wife Helen, a special note of appreciation for her continual encouragement and support provided during the many hectic and trying times spent preparing this thesis.
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INTRODUCTION

Purpose

Over the past few years in the Greater Vancouver Area there has been a marked increase in individuals and groups who have been looking towards the water and floating homes as an alternative to traditional land based accommodation. While there is an abundance of information and literature available related to land based housing there are relatively few articles pertaining specifically to floating homes. It is an intent of this thesis to present an overview of the floating home situation as experienced in the Greater Vancouver Area. This thesis will therefore serve as an information source to both citizens and government officials to foster a better understanding of the floating home situation. In undertaking this study the approach has been to address the major issues and areas of contention that currently exists between floating home residents and local officials and to suggest strategies and programmes whereby they can possibly be alleviated. Furthermore, this thesis also documents and suggests criteria deemed necessary in planning for floating homes and floating home marinas.
The major areas of conflict for local governments, which create a reluctance to permit floating homes, are generally identified as follows:

1. The problem of pollution control as the majority of floating homes discharge wastes untreated into the surrounding waters.

2. The difficulty of collecting revenues for services provided to the floating home via traditional taxation and assessment methods.

3. The problems associated with enforcing local regulations over the water, in light of the tenuous legal powers to do so, caused by the variety of overlapping jurisdictions and proprietary interests. Some of these problems are the enforcement of building codes, fire standards, the provision of community services, parking, lighting, etc.

4. The lack of locational criteria and construction material standards.

Scope of Study

Rather than dealing with any one specific aspect of the floating home phenomenon, it has been the intent of this study to investigate floating homes and the associated issues, in more general terms. This was done primarily to provide a broad base of information, from which further more detailed studies such as socio-economic, lifestyle, or user needs can be initiated. The study does, however, address and discuss in some detail the major areas of contention, namely the pollution problem, the problem of taxation, jurisdictional questions and location criteria.
Due to the piecemeal nature and lack of information which is currently available in either a published or unpublished format it becomes necessary in the first instance to grasp a comprehensive overview and understanding of the situation, which if not undertaken could lead to shortcomings in future studies.

A major constraint encountered in the course of this study was the lack of a detailed data base to work from, especially regarding socio-economic composition of floating home residents, lifestyle choice, costs of floating homes and other data which is commonly available through Canada Census for land oriented dwellings. It is felt, however, that the information obtained for this thesis, through interviews is reliable and generally reflects figures which would have been obtained if a detailed survey of both users and the community at large had been conducted.

Methodology

This study was undertaken and completed by using essentially two methods of analysis. First, a literature review was carried out to ascertain exactly what information was readily available dealing with floating homes. The results of this literature search did not, unfortunately, produce any significant amounts of material that focussed specifically on floating homes.
The second and most beneficial source of information was obtained through interviews conducted with numerous government officials, both in Canada and the United States, as well as with a number of persons who have been involved in promoting the concept of floating home or live-aboard communities.

Local governments contacted for this study, included those which have experienced floating homes locating along their shorelines. These were specifically the North Vancouver District Municipality, the Municipalities of Richmond and Delta and the City of Vancouver.

Information was also obtained from both Seattle, Washington and Marin County, California in order to see how these two locations having large floating home communities, have regulated and controlled their floating home communities. The reason being, to determine the extent of controls instituted and the possibilities of incorporating similar concepts and strategies in British Columbia.

The Greater Vancouver Floating Homes Cooperative, formerly the Coast Floating Homes Association, as well provided a good deal of information.

With the majority of the waters in the area being controlled and regulated by Federal authorities and agencies including the National Harbours Board, (port of Vancouver) the Ministry of Transport, The Fraser River Harbour Commission and The North Fraser River Harbour Commission, a major part
of the information was obtained from these sources.

Definitions

It is necessary initially to clarify in terms of this thesis what is meant by "floating homes". Currently there are numerous terms used to identify water-borne dwelling units, such as live-aboards, houseboats, floating homes and float houses, which are quite frequently used interchangeably when referring to the same type of structure. These definitions are designed to assist the reader, and are not intended for use in legal documents.

**Floating Home/Float House**: A structure or building used for human habitation as a single or multi-family dwelling, constructed on a floatation device, which is not capable of self propulsion. (Sailboats and motor powered watercraft more commonly referred to as "live-aboards" when used for residential purposes are not included in this study, however, many of the issues and recommendations are applicable).

**Live-aboard**: A term usually applied to watercraft, either a sailboat or power boat, capable of independant navigation which are occupied and used for residential purposes.

**Floating Home Marina**: A marina facility that contains one or more moorage spaces for floating homes.

**Houseboat**: A vessel which is capable of and is primarily used in navigation utilizing self-propulsion and not primarily used for permanent habitation.

**Vessel**: includes any ship or boat or any other description of vessel, except a seaplane, used or designed to be used in navigation.
CHAPTER ONE
FLOATING HOMES: A PERSPECTIVE

Generally, the degree of familiarity and knowledge most persons have concerning floating homes is quite limited. Floating homes in relative terms only comprise a small segment of the housing stock, as well, their locations are such that they tend to be isolated from everyday exposure. Because of these two factors, the relative numbers of floating homes and their everyday impact, they do not receive the degree of attention and exposure that other developments normally receive. Because of this limited information and knowledge about floating homes this chapter will provide a background to the floating home situation.

First, the chapter will deal with a brief history of floating homes and secondly provide an insight into the characteristics and issues surrounding the floating home situation as it presently exists. Topics discussed will include: the locations of floating homes, residential characteristics, costs associated with floating homes, demand, attitudes towards floating homes and the main floating home issues and their relationship to waterfront planning in general.
1.1 A Brief History

Historically speaking the concept of persons residing on the water has been practiced for centuries, especially in places such as Hong Kong and Malaya. In these areas the water is an inexpensive alternative housing medium to the less affluent sectors of society.

In more local terms, floating houses and communities were used quite extensively by the logging and fishing industries along the British Columbia coastline during the nineteenth and twentieth century. The advantages floating communities offered these industries were: they provided reasonable accommodation and were easily transported from one location to another in the event that the particular resource of the area had been depleted. The mobility factor of the floating camps benefitted these industries in that great savings could be realized by not having to construct new towns when a move was made. The only significant cost incurred by using floating communities were those associated in towing the community from one location to the next.

During the latter half of the nineteenth century and continuing into the twentieth century, floating homes also served as housing of last resort for many low income persons and families. Floating homes during this period were constructed from scrap or discarded building materials and provided only basic shelter from the elements with few, if any, amenities provided. This aspect of floating homes was
particularly characterized by persons inhabiting floating homes along the shorelines of major rivers in the United States such as the Ohio and Mississippi Rivers. Photographs taken in the 1930's of the waterfront areas around Vancouver show large numbers of derelict shanties occupying the shorelines. These units, it is believed first appeared with the founding of Vancouver and large numbers remained until just after World War II when they were finally removed. It is interesting to note that this negative image of floating homes still appears to prevail in many peoples minds when they visualize floating homes.

In Marin County, California, located immediately north of San Francisco, floating homes have been used for residential purposes from the 1850's. Initially these floating homes served as summer residences for persons living in San Francisco. Seattle Washington has also had experience with floating homes, with their use on Lake Union dating back to the turn of the century.

Floating homes, as has already been mentioned are certainly not only particular to the urban coastlines of British Columbia. Most major coastal area cities along the United States coast namely, Seattle, Portland, and San Francisco have experienced the development of floating homes within close proximity. There is, however, one major difference evidenced between the United States experience and the British Columbia experience, this being in the
approaches taken towards the inclusion of floating homes as recognized alternative housing. Both Marin County, California and Seattle Washington have recognized and responded to floating home concerns in their areas and have undertaken extensive measures to ensure orderly, planned development. These areas, in 1968 instituted and adopted specific ordinances and codes aimed directly at floating homes.

The British Columbia experience on the other hand has been characterized by a virtual absence of any comparable measures to effectively deal with floating homes. Until only recently various local governments have been satisfied to either prohibit floating homes or ignore them in the hope that they will go away. In 1975 the Municipality of Richmond carried out a Marina Study which included a live-aboard section. In February of 1977 the City of Vancouver instituted a study on floating homes to investigate various aspects of floating homes. An intent of the Vancouver study is to make recommendations regarding requirements necessary for floating homes and to suggest possible locations for floating homes to establish. The District Municipality of North Vancouver has also become involved with floating homes, having recently given conditional approval for a privately developed floating home village to locate along its shorelines. The municipality has also given indication of including floating homes as a possible use in the Seymour Planning Study.
1.2 Location

Floating homes are presently located at various moorages throughout the lower mainland region. For the most part, floating homes are interspersed in marinas which cater to recreational watercraft as well. The City of Vancouver, in its recently initiated study of floating homes, included as part of the study the documentation of both the numbers of floating homes and their locations. This survey was carried out from the water by patrolling the coastal areas of the lower mainland region. Because of the inaccessible nature of the coastline by road, a personal survey resulted in fewer numbers of floating homes and their locations being observed. The Vancouver survey estimates that there are currently about one hundred forty floating homes throughout the region. This figure does not include approximately eighteen floating commercial structures or the twenty-six unit "Aquatic Village" development proposed for the Municipality of North Vancouver. Map #1 indicates the numbers of floating homes and the locations in the Greater Vancouver area.

1.3 Costs of Floating Homes

Assessing the average costs of floating homes is a difficult task as there are no records kept of selling prices or construction costs of the units. Floating homes are not sold as real property but rather as personal
MAP 1: FLOATING HOME LOCATIONS AND NUMBERS IN THE LOWER MAINLAND AREA
property for which the Real Estate Board or Assessment agencies do not maintain records. Secondly the construction of the units, in the majority of cases, is carried out by the owners themselves. In this self-help situation, many persons can make deals on various materials or can recycle components obtained elsewhere and incorporate them into the dwellings. Another difficulty experienced in trying to estimate costs is a reluctance encountered at a number of marinas to disclose moorage rates that are being charged to floating home residents. In any event, some information was made available which, it is assumed are representative of costs and conditions in general.

There are basically two methods used by marine operators to assess moorage charges. Fees can either be assessed on a per lineal foot basis or alternatively on a per square foot basis of actual area occupied. The estimated average monthly moorage fee of civic marinas in the lower mainland area is currently about two dollars and fifty cents per foot while the charge levied on a per square foot basis is twenty-five cents.1 Services provided for the fee charged basically includes moorage and water with parking and electricity being additional charges.

At Harbour Ferries, located at the north foot of Denman Street in Vancouver, the current fee structure is one dollar and seventy-five cents per foot, which includes the

1. Interview Mrs. Sonja Johnson February 11, 1977
provision of water. Electricity is charged at five dollars per month and parking is eight dollars per month. Moorage spaces at this particular marina are leased on a yearly basis. Floating homes, (including live-aboards) in Coal Harbour, are also subject to pay to the marina operator a fee equivalent to the license fee that is charged to the operator by the City of Vancouver. The particular by-law and license fee schedule applied to marinas mooring floating homes and live-aboards is contained in appendices 1 and 2. The purpose of this fee is to obtain revenues in lieu of taxes which currently cannot be assessed and collected under existing legislation. The proposed "Aquatic Village" development, planned for the municipality of North Vancouver, will be charging one hundred twenty-five dollars per month for moorage including parking. Added to this, each of the occupants of the twenty-six units proposed will be assessed a three hundred ninety dollar per year "grant in lieu of taxes" which the marina operator will in turn pay to the municipality.2

For comparison in Marin County, California the current moorage rate structure for floating homes is assessed in the following manner: four dollars sixty cents per foot for width, two dollars forty cents per foot for length, and a flat sixteen dollar fee for a second floor.

2. Interview Mr. Frank Ogden, Premiere Module Structures, January 12, 1977
The average berthing cost in Marin County is approximately one hundred forty dollars a month plus utilities. Services provided include sewer hook-ups, parking, water, electricity and gas.

As previously mentioned the determination of construction costs for floating homes is difficult to estimate, as the majority of the units are self designed and built. As a result, a variety of construction materials and techniques are utilized in both the design of the superstructure and the floatation devices. There are no accurate figures available which list construction costs or selling prices for floating homes, however, in discussions with various persons involved with floating homes some broad estimates can be made.

The sizes of floating homes can range anywhere from two hundred square feet to in excess of one thousand square feet with six to eight hundred square feet being the average. The costs of building these units (in a self-help situation) can range from around $10,000.00 to $25,000.00 and up for units of good quality construction and design. The current selling prices again cover a wide range but generally speaking, good quality homes sell from $15,000.00 to in excess of $40,000.00 for larger more luxurious units. The floating home units in the "Aquatic Village" development

3. Correspondence Mr. R. Larsens, Marina Inspector, Marin County, California, January 31, 1977
will be selling for approximately $45,000.00 completely furnished. In Marin County California the prices of floating home covers a wide range. For units which meet county standards, selling prices start at a low of approximately $9,000.00 and progress upwards to a high of $110,000.00.

Because of the unique nature of floating homes being located on the water and not affixed to real property it is not possible for floating home residents to secure National Housing Act, Central Mortgage and Housing guaranteed homeowner loans. Therefore it is necessary for these persons to secure private loans from banks or finance companies under less favourable interest rates and terms of repayment.

Mr. Frank Ogden, of Premiere Module Structures, visited several lending institutions to ascertain what financing could be arranged for the floating home units in the "Aquatic Village" development. Terms at one location for a $25,000.00 loan were payments of 325.00 per month for a five year term ammortized over fifteen years, while another institution could arrange a $25,000.00 loan for a nine year period with payments of $364.00 per month. Loans for floating homes can be very difficult to obtain because of their present legal status. Loans issued for floating homes cannot be secured by way of a mortgage registered in the land registry against the house and the land on which it sits. Loans can presently be secured in two fashions, one being a chattel mortgage against the dwelling itself.
registered with The Registrar General of the Central Registry or alternatively as some persons have done by registering their units as non-propelled vessels with the Federal Ministry of Transport to secure financing. Financial institutions are quite reluctant in granting loans for floating homes in a situation where they can possibly be moved on or sold without notification being given.

1.4 Demand

It is quite difficult to accurately ascertain demand for floating homes as an option to traditional land based accommodation. The present status of floating homes is such that there is no assured security of tenure in any of the locations where they are presently moored. This lack of security has been fostered by a historical progression of negative attitudes towards floating homes being voiced by various municipal and federal agencies. It has been these negative attitudes which have deterred many potential floating home residents from pursuing this form of accommodation.

The real demand for floating homes is one which is created, that is, if attitudes and actions changed to ones which permitted and established floating homes the result would undoubtedly show a commensurate increase in persons seeking floating homes as a housing option. This aspect of demand being created has been evidenced through inform
ation obtained through the Greater Vancouver Floating Homes Cooperative.

During the initial phases of the development of the False Creek Live-Aboard Community, a questionnaire was distributed by the Cooperative and was responded to by one hundred thirty-eight persons, that wished to be considered for moorage when it becomes available. The conditions under which this questionnaire was distributed indicates the seriousness of the respondents. In order to receive a questionnaire a person had to agree to pay $100.00 to join the association or indicate that they would pay the money at a later date. A purpose of this questionnaire was to establish in what location, either Richmond or Vancouver (False Creek) persons would prefer to establish a floating home community. In addition to this questionnaire Mrs. Sonja (Sunny) Johnson, (former secretary of the Greater Vancouver Floating Homes Cooperative and its immediate predecessor the Coast Floating Homes Association) indicated that during the period from May 1973 until June of 1976 she would receive on the average thirty phone calls per month from various persons interested in the concept and feasibility of living on the water.

Evidence of the potential demand for floating homes in the Greater Vancouver area can undoubtedly be equated with demand as experienced in Marin County, California and Seattle, Washington, both of which have recognized and controlled
floating homes for nine years. Correspondance received from the Department of Community Development in Seattle indicates that "floating homes are much in demand and extremely expensive, either to rent or to buy or build." Similarly Mr. Richard Larsens, Marina Inspector for Marin County California, indicated that there is a large demand for floating homes with selling prices indicative of the demand.

1.5 Attitudes

Proponents of floating homes all agree that there is a definite need for more moorages and better facilities to accommodate floating homes. The reluctance, on the other hand, of municipalities to approve locations for this form of accommodation is indicative of attitudes towards floating homes. Municipal governments in the lower mainland region of British Columbia have historically taken a negative posture towards floating homes for a variety of reasons. The fact that floating homes are not directly taxable is one problem, also, municipalities have cited the problems of sewage disposal as being another major concern. Municipalities as such, also have little or no control over the location of floating homes, building codes, design criteria etc. Following from this, inadequacies exist in terms of back-up

4. Correspondence, Ms. Rosemary Horwood, Senior Planner City of Seattle, Department of Community Development August 12, 1976
services such as fire protection, water, and adequate parking being provided. The Municipality of Richmond, in its experience with floating homes did not seriously object to floating homes when they first appeared at marinas along the middle arm of the Fraser River. Over time, however, the numbers of floating homes increased to such an extent to cause an overall decline in the lifestyle. Back-up facilities such as parking, sewage disposal etc. became inadequate to cope with the increased pressure. Moreover, these floating homes were also located in the flight path of the Vancouver Airport and are subjected to noise levels that are not conducive to residential uses.

City of Vancouver by-laws prohibit floating homes, however, they do allow for live-aboards to locate in the proposed False Creek Floating Homes Cooperative. Similarly, the Municipality of Delta prohibits the use of live-aboards as residences in their zoning by-law, but municipal authority over waters along the Fraser River are superceded by the powers of the Fraser River Harbour Commission.

Municipal and other agencies attitudes towards floating homes also refer to the social base of the inhabitants. Often floating homes have been associated with transients or undesireables or societal freeloaders, a stigma which appears to have remained from earlier days when floating homes provided accommodation of last resort. It can be assumed that municipal officials attitudes reflect the
opinions of the community at large. In this case, negative opinions expressed by local rate payers can be attributed to having a significant influence on views expressed by local politicians. There have been negative comments voiced by the citizenry at large. One example is of a resident in Deep Cove who stated in the Vancouver Sun that she objected to floating homes because of the possible negative effects they would have on property values. Criticisms like this, even though they may be valid, tend to fuel the fire of negativisms working against floating homes in general.

Negative comments voiced by local governments have expressed concern over the aesthetics of floating homes and the floating home moorages. But as will be discussed later in this thesis, these are problems which can be overcome by adopting appropriate design and construction guidelines for both floating home moorages and the units themselves. Related to this, and perhaps the greatest single factor producing negative attitudes towards floating homes, are the images that are formed by being exposed to floating home moorages which are delapidated, crowded and not comprehensively planned for such purposes.

Federal government agencies contacted expressed differing opinions towards floating homes locating in their jurisdiction. In 1973 the National Harbours
Board "came out publicly against houseboats when Ehman Kahn, then the N.H.B. chief executive officer, stated in a letter to Vancouver Alderman Setty Pendakur that the board opposes such structures springing up uncontrollably along the waterfront."\(^5\) Since this time the Harbours Board has continued to take a dim view of floating homes. Other Federal agencies, such as the Ministry of Transport, the North Fraser and Fraser River Harbour Commissions tend to proceed with action against floating homes in response to objections voiced by local governments. The primary function of these Federal agencies is to ensure the smooth operation of the harbour regarding transportation and commerce. If floating homes do not interfere with these, navigation and commerce, the agency is not likely to take any action against them.

A number of reports issued by or prepared for the City of Seattle take a rather different approach regarding the status of the floating homes located on Lake Union. The "Lake Union Preliminary Comprehensive Plan and Action Program" carried out in 1971 stated that:

"Shorelines in Seattle, as well as elsewhere are a scarce and valued resource. There are numerous activities ranging from recreation and pleasure boat moorage to manufacturing, industrial and

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5. N.H.B. "Policy Change Favours Houseboats", Vancouver Sun, November 3, 1976
commercial uses which could not exist any place except along the shoreline. Nonwater needing uses, such as offices and apartments have emerged as strong competitors for shoreline space— not because they require direct access to the water, but because proximity is an amenity and attraction to the occupants of those buildings. A major purpose of this plan is to enable water needing industries and floating homes to continue to exist and compete for space on the shorelines." 6

The city of Seattle's planning department also issued a similar statement in 1972.

"The uniqueness and sense of place that exist on Lake Union are qualities which contribute significantly to the image of Seattle as a whole. There is a high level of variety and complexity among the activities on the lakeshore. If removed from the water, many of these activities would not be compatible neighbours. However, the lake provides a common orientation and resource. The houseboats are a special adaptation of the use of water to a residential activity. To a degree this also is true of a number of marine related enterprises. These qualities should be conserved and enhanced." 7

The purely reactionary or negative attitudes towards floating homes which have prevailed in the lower mainland region appear to be changing to a degree. The Richmond Marina Study 1975 indicated a somewhat more positive approach to floating homes if they can be adequately serviced and regulated. The report states that "it is therefore

7. Development Memorandum , Department of Community Development, City of Seattle, October 16, 1972. pp. 7
recommended that a general policy be developed for this form of housing which would encompass the above considerations." These "considerations", referred to quality construction, design, adequate servicing, support facilities, amenities etc. The City of Vancouver has recently instituted a floating home study which will look at, among other things, possible locations for floating homes along the Vancouver shoreline, which indicates a possible change in attitude towards floating homes. The District of the Municipality of North Vancouver has also taken a more favourable position towards floating homes. Discussions with the municipality indicated a desire to investigate the possibilities of incorporating floating homes in the Seymour Planning Study.  

8. Corporation of the Township of Richmond, Richmond Marina Study 1975, Planning Department, April 1975

9. Interview Mr. F. Sigurjonnson, Senior Planner, District Municipality of North Vancouver, January 11, 1977
1.6 Floating Home Residents

Information obtained in discussions with persons involved with floating homes indicates that the socio-economic mix of persons choosing this lifestyle is quite diversified. In Marin County, California, for example, Mr. Richard Larsens, Marina Inspector for the county indicated that in his opinion it would be hard, if not impossible, to find a more mixed social and economic community. "...the community is comprised of doctors, lawyers, stockbrokers, teachers, writers, artists, carpenters, plumbers, labourers, welfare recipients, run-aways etc. with as many philosophies as you can name." Mr. Robert Fenton, president of the Greater Vancouver Floating Homes Cooperative and others interviewed also indicated that the socio-economic mix in the Greater Vancouver area is similar. Data obtained from a questionnaire distributed by the Floating Homes Cooperative to persons interested living on the water indicated that "two person" households showed the greatest interest in living on the water. Only seven of the ninety-one responses to this section of the questionnaire indicated that they would have children living on the water.

A number of reasons for persons choosing to live on the water have been documented. Gordon Eekman cited two primary motivations leading people to this lifestyle. One being for "environmental aesthetics and a second reason for
the humanizing nature found there." Living on floating homes seems to bond persons together, probably due to the common interest they share. Other reasons were given, but in many cases seemingly not the most important are the proximity of the locations and the comparative cost of floating homes. As shown earlier in this chapter floating homes are not inexpensive housing types, in fact the costs are rising. Evidence from Marin County, where floating homes are permitted and strictly regulated suggests that since floating homes have been increasing. The construction of new floating home harbours, the upgrading of individual floating homes (both because of regulations and the higher moorage fees) are gradually forcing out poor quality floating homes and their residents. At the same time and for reasons mentioned earlier (proximity to San Francisco, a desire to live on the water and the opportunity for a new way of life) more and more affluent people are becoming attracted to floating homes.

To residents, floating homes also offer the opportunity for self-expression to be incorporated into their dwellings. Unlike standard subdivision housing, floating homes are the products of the owners own design ideas and are often constructed by the owners themselves. A visit to any floating home moorage certainly makes this point clear as it is highly unlikely one will find any two units the same. The

floating home satisfies a need or desire of many persons to create one's own living environment while sharing a common setting. The self-help aspect allows the resident to build in features or incorporate details which add to the satisfaction of the residence. Contemporary housing ideas such as shell-housing, cooperatives and public housing projects have become aware of the need for more user input into the final product. The reason being the degree of satisfaction has been shown to increase as a function of the amount of involvement the resident has had in the finished product.

Accessibility or proximity to urban services are also given as a reason for wanting to occupy a floating home. This is especially true for those located in areas such as Coal Harbour. These residences are within ten minute walking distance to the central city shopping area, yet because of their location offer a great deal of isolation and inaccessibility from the activities of the city. Between the moorage itself and the downtown area there is transitional industrial area which acts as a buffer between the city and the activities on the water. This "manipulated distance" in fact makes the floating home psychologically more distant to the resident than would be the case if a person lived in other housing of the same physical distance away from the downtown area.
1.7 Floating Homes and Waterfront Planning

Mr. Mark London, in an article entitled "Urban Waterfront Planning" identified a number of issues that appear related to the reluctance to develop specific floating home policies. Floating homes are obviously a waterfront use and as such pose problems characteristic of those encountered in planning for the waterfront in general. These are:

"1. More than the usual number of agencies must participate in the planning and approval process.

2. The land water interface often leads to extra studies and more complex design solutions.

3. Waterfronts are often the site of innovative urban uses which are more difficult to plan than standard developments.

4. The waterfronts visibility leads many people and agencies to formulate personal images for the area which they are then reluctant to compromise in the planning process.

5. The waterfronts uniquely critical location leads to an increased fear of inappropriate decisions and results in slower approvals."

The foregoing issues, related to difficulties encountered in waterfront planning in general compound the problems associated with floating homes specifically. The three major issues identified as creating the greatest difficulties in dealing with floating homes are:

11. London, Mark Urban Waterfront Planning In Forum Canadian Institute of Planners, pp. 3-7 (1976)
associated with jurisdiction as to who can effectively control floating homes given the complex nature of the administration of the water. Municipal governments do not directly control use over the waters bordering their municipalities. A second major problem has been the question of taxation as such, floating homes are not assessable for municipal taxation purposes. The third problem deals with aspects of pollution, in that floating homes directly discharge domestic wastes into surrounding waters.

These three areas of conflict have continually posed problems to government agencies and have generally fostered a reluctance to seriously consider floating homes. These three specific issues are addressed in the following chapters, the purpose being to clarify the issues and to suggest possible strategies that can be used to overcome them. Finally this thesis looks at those elements deemed necessary to consider when undertaking to develop policies or guidelines regulating location, siting, construction and the design of floating homes and floating home moorages.
CHAPTER TWO
JURISDICTIONAL CONTROLS

In order to successfully adopt regulatory mechanisms respecting floating homes it is necessary to have an understanding of the agencies which govern the waters surrounding the lower mainland area. It is the purpose of this chapter to document the current jurisdictional infrastructure and to suggest methods to control and regulate floating homes within the prevailing system.

2.1 Government Agencies Controls

The urban coastal shorelines of British Columbia are regulated and administered by a wide range of government agencies and statutes. The major agencies governing the waters are themselves subject to seemingly endless list of statutory provisions included in numerous ancillary acts and by-laws, such as Pollution Control Acts, Fisheries Acts, the Navigable Waters Protection Act and by-laws adopted by various harbour commissions and harbour boards.

The agencies who are involved with the administration of British Columbia's coastal waters and harbours are: The National Harbours Board, The Federal Ministry of Transport, the Fraser Harbour Commission, the North Fraser River Harbour Commission and the Provincial Government, which administers water lot leasing through the Ministry of Lands,
Forests and Water Resources.

To understand the nature of Federal and Provincial interests of British Columbia's waterways it is necessary to briefly review the historical events leading to the current situation.

2.2 Public Harbours

Section 108 of the British North America Act of 1867 transferred the property described in the third schedule of the B.N.A. Act, 1867 to the Dominion. Item two of this schedule indicates that "public harbours" were to become the property of Canada. The question is then asked what constitutes "public harbours"? The interpretation of what constitutes a "public harbour" has been the subject of numerous debates and litigation. "It is now settled that harbours that passed to the Dominion under Section 108 were those that fell within the description of public harbours on the day the particular province entered Confederation."\(^1\) It seems that Section 108 did not apply to obscure harbours but to those publicly known or recognized by the provinces upon entering Confederation. The important reason for placing public harbours within the jurisdiction of the Dominion was that, "being charged with exclusive jurisdiction over such matters as navigation and shipping, seacoast and inland

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1. La Forest, V. Gerald *Natural Resources & Public Property Under the Canadian Constitution*. University of Toronto Press 1969. pp. 56
fisheries, lighthouses and bouys, it was no doubt expected that it would assume the burden of conservancy of harbours, and maintaining navigation and harbour works."

Having very briefly examined the nature of Public Harbours it is interesting to determine exactly what interest was passed to the Dominion. It is generally held that the beds of Public Harbours, which include a number of designated National Harbours and Harbours operated by Harbour Commissions are the property of the Dominion Crown. Owing to this proprietary right the Federal Government either through the Ministry of Transport, the National Harbours Board or the various Harbour Commissions is responsible for the leasing of a vast area of the Greater Vancouver Coastline.

2.3 The Six Harbours Agreement 1924

To settle the problem in British Columbia of determining what was provincial and what was federal property respecting harbours, culminated in the Six Harbours Agreement of 1924. Under the terms of the agreement the six harbours of Victoria, Esquimalt, Nanaimo, Alberni, Burrard Inlet, and New Westminster became the public harbours of British Columbia. The province also agreed to the possibility of transferring other harbours in the future which were

2. Ibid pp.56
NATIONAL HARBOURS BOARD (proprietary)

NATIONAL HARBOURS BOARD (navigational jurisdiction)
Province owns seabed and administers waterlot leasing.

NORTH FRASER RIVER HARBOUR COMMISSION (lease from Province)

FRASER RIVER HARBOUR COMMISSION (Railway Belt lands, owned by the Dominion Crown)

FRASER RIVER HARBOUR COMMISSION (lease from Province)
used as harbours prior to the agreement as may be required by the Dominion.

2.4 The Railway Belt

Even though New Westminster was established as a Public Harbour, Federal authority extends throughout all of the lower portions of the Fraser River west of Pitt Lake and Kanaka Creek. Federal ownership along the Fraser River was established in an agreement with the Province in 1930. The Dominion agreed to retransfer all lands back to the province which heretofore were Dominion lands called the Railway Belt. (The Railway Belt Lands were initially transferred by the Province to the Dominion at Confederation as a condition of the railway being extended to British Columbia.) However, it was also established in paragraph two of this agreement that:

"the foreshores and beds of harbours already established within the Railway Belt, as well as the foreshores and beds of the Fraser River and Pitt River lying above the eastern boundaries of New Westminster Harbour and below lines to be ascertained and defined by agreement at the junction of Kanaka Creek with the Fraser River and at a point of the exit of the Pitt River from Pitt Lake would continue to belong to Canada." 3

3. Ibid pp. 69
2.5 The Fraser River Harbour Commission

Map # 2 indicates that portion of the Fraser River which comes under the administration of the Fraser River Harbour Commission. This map shows that portion which is owned by the Dominion while that portion of the river west of the western boudaries of New Westminster Harbour, including the riverbed are leased to the Commission by the Province of British Columbia for a period of twenty-one years. The Harbour Commission obtained this lease from the Ministry of Lands, Forests and Water Resources and agree to return to the province fifty percent of all rentals and royalties collected from the use of this portion of the river. Within this section of the river the Fraser River Harbour Commission has direct control respecting the granting of waterlot leases for any purpose. Lessees in this portion of the river must conform to provincial pollution control regulations.

2.6 North Fraser River Harbour Commission

Unlike the Fraser River Harbour Commission the North Fraser River Harbour Commission administers only a very small portion of the river that is owned by the Dominion Crown. (See Map # 2) The N.F.R.H.C. and the territory it presides over, is both river and riverbed leased to the commission by the Provincial Government. The period of the lease agreement again is for a period of twenty-one
years and was renewed in 1972. Similar to the Fraser River Harbour Commission, the North Fraser River Harbour Commission is responsible for granting water lot leases and also agrees to pay to the Province fifty percent of revenues collected resulting from its operation.

2.7 National Harbours Board

The Government of Canada under provisions of the National Harbours Act has designated a number of Canadian harbours including Vancouver harbour as National harbours. National harbours such as Vancouver are designated because of the important position they occupy as transportation centres in the trade and commerce of the entire nation. Map #2 indicates that areas of the Greater Vancouver coastline come under various levels of jurisdiction of the National Harbours Board. That portion east of the First Narrows is for leasing purposes controlled by the National Harbours Board. That area indicated on Map #2, to the west of the First Narrows, is under National Harbours Board jurisdiction but only as it related to controlling and regulating navigation. The seabed here is the property of the province and because of this ownership the Province administers and grants water lot leases in these waters.
2.8 Federal Ministry of Transport

The Federal Ministry of Transport although not administering any waterlot leases within the immediate vicinity of Vancouver is responsible for the administration of twenty-two designated public harbours in British Columbia. Examples of such harbours include Victoria, and Esquimalt. The Ministry of Transport is also responsible for the operation and maintenance of numerous wharves, and piers along the British Columbia coast. In addition to these duties the Ministry if also responsible for developing and administering regulations concerning shipping, vessels and navigation.

2.9 Provincial Administration

Generally speaking the Province, through the auspices of the Ministry of Lands, Forests and Water Resources administers and grants leases for all remaining waterways and minor harbours. Eg. Oak Bay Marina, Canoe Cove etc.

2.10 Local Government Involvement

After having completed a basic examination of both Federal and Provincial jurisdictional controls over water, it appears at first glance that local authorities have virtually no control over leasing procedures. This, however, is not the case. Both the Federal and Provincial agencies do provide withing the enabling legislation that
local input will be sought after, either through informal arrangements or by local representation on the specific boards or commissions. In this way then, the senior governments should theoretically be sensitive to the aspirations of local authorities. A few examples of how local attitudes and concerns are incorporated are illustrated in the following:

The Ministry of Transport in its traditional lease agreements ensures that the lessee will conform to the aspirations of the local governments specifically Clause two which states that "the lessee will pay or cause to be paid all rates, taxes and assessments of whatsoever description that may at any time during the existence of the presence be lawfully imposed or become due and payable upon or in respect of the said land (includes water over land controlled by M.O.T.) or any part thereof." Clause three goes on to say that "the lessee shall in all respects abide by and comply with all lawful rules, regulations and by-laws of municipalities and other governing bodies in any manner affecting the said land." Yet another indication of a senior agency's concern for local government involvement was recently expressed by Mr. Scott McLaren secretary of the Fraser River Harbour Commission who

requested that municipalities bordering the Fraser River within their jurisdiction draw up common by-laws respecting floating homes. This was done in response to problems the commission was being continually faced with floating homes indiscriminantly locating along the river. The commission therefore, adopted the position that municipalities should prepare by-laws expressing their attitudes towards floating homes locating along their shorelines. In this regard the Harbour Commission could, by incorporating purpose clauses in future lease agreements or renewals ensure that municipal wishes would be met and floating homes if permitted would subject to local controls.

The North Fraser River Harbour Commission has also worked closely with the Municipality of Richmond to control floating homes. This relationship resulted in nearly all of the floating homes located in Richmond being told to vacate. The situation which existed in Richmond was that, initially, with only a few floating homes there was no serious problem, however, the numbers of floating homes rapidly increased without adequate back-up facilities being available, such as sewage disposal, and parking. As well, the mobility of the municipality to procure tax revenue posed a problem. In response to Richmond's concerns, the North Fraser River Harbour Commission ordered all houseboats (except for one per marina for security purposes) to vacate within one year of July 1976. The authority to request
their removal was based on the fact that in the terms of the lease agreement with marina operators, floating homes were not provided for.

2.11 Sub-Leasing

Generally speaking, agencies controlling the initial lease such as the Ministry of Transport, Harbour Commissions, and the National Harbours Board do not look favourably on permitting sub-lease agreements to any great extent. However, in certain situations they are permitted. An interesting example recently occurred involving the National Harbours Board and the District Municipality of North Vancouver. In this particular case the municipality had leasehold title to a waterlot at the foot of Pemberton street in North Vancouver. An application was made to the Municipality proposing a floating home community. The municipality, not agreeing with the developers initial site, suggested the location be changed to a waterlot area leased by the municipality. Although a few details still need to be worked out a sub-lease was permitted by the National Harbours Board which in turn gave the municipality direct control over the development. Terms and conditions that the municipality deemed necessary to permit this use are simply written into the sub-lease agreement.
2.12 Controls regulating Construction and Design of Floating Homes

In British Columbia there are virtually no regulations which pertain specifically to or encompass the construction of floating homes. In light of this situation each floating home resident can construct and live in a dwelling unit of any description and not have to comply with any building codes, electrical standards, fire standards, sewage disposal standards etc.

Our counterparts in the United States have responded to the floating home concept in a different fashion and have gone about adopting comprehensive ordinances to regulatory procedures relating to floating homes. In Marin County, California, the county has taken the incentive of developing ordinances and requires all floating homes locating to conform to these or face eviction. In Washington State the City of Seattle has also developed ordinances particular to floating homes which are quite similar to those in force in Marin County. Copies of these ordinances are included in appendices 4, 8 and 9.

2.13 Direct Controls Re: Construction, Floatation, etc.

At the outset of this study a primary objective was to obtain information to determine which agency had direct control or regulatory authority over floating homes. Initial discussions took place with the Federal Ministry of
LEAF 41 OMITTED IN PAGE NUMBERING.
Transport who control, regulate, and set standards for vessels. The M.O.T. indicated that in their opinion such power was vested with local harbour and port authorities. The Harbour Commissions do have control but this control extends only insofar as it applies to allowing floating homes to locate within their jurisdiction.

In the opinion of the Fraser River Harbour Commission "Houseboats are vessels and are not subject to municipal, provincial or harbour commission control in any respect and fall totally under Ministry of Transport Authority."^5

Following from this statement and upon looking at the Canada Shipping Act small Vessels Regulation P.C. 1969-436 the actual extent of Ministry of Transport authority over floating homes is questionable. In this act the definition of a "vessel includes any ship or boat or any other description of vessel except a seaplane, used or designed to be used in navigation."^6 This phrase, used or designed to be used in navigation may perhaps not be applicable to and include floathouses as defined by this thesis, as they are essentially used and designed to be used as housing and are or would be permanently moored in one location. The fact that they are moveable by means of towing, it is felt, does not constitute "navigation" under the intent of the Act.

5. Mr. Scott McLaren as cited in the Vancouver Sun, Thursday November 16, 1976 pp. 17

2.14 Self Administration

Due to the almost complete lack of guidelines and control mechanisms emanating from various levels of government, the response has been for organization such as the Greater Vancouver Floating Homes Co-operative to research and prepare their own set of standards for construction and design. These regulations do not only limit their scope to the dwelling units themselves, they are also concerned with the layout and operation of floating home moorages as well.

The co-operative makes these guidelines available to all co-operative members under the conditions that they must comply to these standards as a condition of securing moorage in a co-operative marina venture. Standards adopted for construction are those of the Canadian Code for Residential Construction (N.R.C.C. #11562), which includes both plumbing and electrical codes.

The reasons for establishing these standards are five-fold and are expressed in a Coast Floating Home Document entitled "Interim Standards for Floating Homes" Oct. 1973:

1. To provide a basis for approval by municipal governments will aid in the regulations, taxation, and control of floating homes.

2. To establish a basis within the C.F.H.A. (Coast Floating Homes Association) which will allow the C.F.H.A. to register and issue approval for existing and future floating homes.
3. To serve as a guide to construction which will result in floating homes which meet minimum standards of safety, health and appearance.

4. To serve as an assurance to marina operators that C.F.H.A. approved floating homes do in fact meet minimum acceptable standards.

5. It is not the intent of these standards to dictate particular types of construction, to limit design consideration or to set arbitrary standards on appearance. However, it is the consensus of the C.F.H.A. that the best interests of the association and the community will be served by discouraging sub-standard floating homes which are not aesthetically pleasing.

The problem has been that even though standards have been established by this organization as a means of self regulation there has been a reluctance by local governments to adopt these regulations. The difficulty may accountable in an attitude that the only standards which are valid will be ones produced by the governments themselves.

2.15 A New Federal Ports Management Scheme

The Federal Government has been involved the last three years in a program to establish a new management system for Canadian ports. An interdepartmental committee, chaired by Mr. G.A. Scott was formed in 1974 "to review existing port management structures and develop a new management framework responsive to current and anticipated demands on ports within an integrated transportation
The recommendations of this committee were to establish "a new single comprehensive ports organization based largely on a national ports policy and planning function, substantial local autonomy in the management of major ports, and regional participation in the port planning process." Cabinet approved these recommendations and directed a task force to develop all the details of a new management structure.

The outcome of this task force work was the directive that a Canada Ports Act be drafted to replace the National Harbours Board and Harbour Commissions Acts and numerous other acts which govern both the operation and management of Canadian ports.

This simple system of a port management would incorporate all ports, public harbours and government wharves that are utilized for transportation purposes. This single system approach is to enable a Canadian Ports Commission to be established to institute a coordinated national policy and planning process, a goal which has been identified as being unattainable within the present framework of port administration.

The impact of this reorganizational process of port management will not likely change to any great extent the present administration at the local level because local port...

7. Transport Canada, Canadian Ports: A New Management, Sept. 1976, pp. 2
8. Ibid, pp. 2
commissions will generally be retained in British Columbia as they presently exist. These local commissions will still be responsible for the day to day operation of the ports and therefore the basic jurisdictional infrastructure of granting and administering leases and transportation will not be effectively altered.

2.16 Recommendations and Conclusions

Given the existing situation of the variety of senior government agencies which control and regulate the coastal and riverine areas of British Columbia it is believed possible that an effective operating system can be established. This system can control and regulate floating homes and floating home communities. In any event, the implementation of a workable system can only be effectively accomplished under terms of mutual cooperation between senior and local officials to meet these ends. Those agencies involved with or affected by floating homes should establish and make their particular goals and objectives clearly ascertainable to one another.

Municipalities which are currently experiencing pressures for floating home development or others who may in fact be faced with the situation in the future, should establish policy either permitting or refusing floating homes. It is desirable that in both cases of either acceptance or rejection, policy should be based on a
comprehensive investigation of the suitability of floating homes locating along their shorelines. Municipalities which do foresee floating homes as a compatible use should then pursue a course of identifying and possibly zoning areas deemed appropriate for them to locate. This foregoing procedure has already been carried out by the Municipality of Richmond which views floating homes as viable only if adequate control procedures are adopted. The Municipality has also identified potential locations for future floating home developments to locate.

Commensurate with the adoption of a policy to allow floating homes, local authorities need also to formulate adequate by-laws or ordinances that reflect and ensure municipal requirements are met. Having adopted or instituted these mechanisms it becomes relatively easy to ensure that all conditions will be followed. The leasing agencies such as the National Harbours Board, the Ministry of Transport or Harbour Commissions need only incorporate adequate "purpose clauses" in their lease agreements with developers or agencies to the effect that all local by-laws pertaining to floating homes will be adhered to.

It appears highly unlikely that senior government agencies such as the Federal Ministry of Transport, Harbour Commissions or Harbours Boards will adopt standards and guidelines for floating homes, simply because of the magnitude and nature of the phenomenon. Regulations and
standards should be developed at the local level where they will be formulated respecting local conditions and previously established standards. Standards vary from one municipality to another making it impossible for senior agencies to develop guidelines which will only be general in nature and insensitive to the local situation.

Municipal governments upon adoption of such policies or standards should make available to the leasing authority in question copies of such documents. This would thereby enable the leasing authority to ascertain upon receipt of an application for a waterlot use providing for floating homes of where, and under what conditions the municipality will allow floating homes.
CHAPTER THREE
TAXATION AND ASSESSMENT

3.1 The Taxation Issue

A major factor which has led many municipal governments to either ignore or prohibit floating homes communities has revolved around the issue and the seemingly difficult task of ensuring revenue contribution by persons living in floating homes. Currently, under existing legislation it is virtually impossible to impose direct taxation procedures on floating home residents. Floating structures are not assessable under either the British Columbia Assessment Act or the Municipal Act, as a "vessel" does not come within the definition of an improvement under these Acts, according to the decision in the case of S.A. Marina vs. the City of North Vancouver. This aspect which illustrates the difficulty of imposing direct taxation, is only one of the maze of legal issues involving constitutional, municipal and taxation laws. The problem is not that floating home people do not want to contribute their fair share of municipal revenues, rather, the opposite view is taken. The Coast Floating Homes Cooperative are organizations that have continually expressed a willingness to pay their share of municipal revenues. The stumbling block has been the difficulty in developing and implementing a uniform system of revenue collection which is both lawful and will enable municipal
governments to carry on with the provision of required services and provide for the orderly development of the foreshore.

3.2 The United States Approach

In California and Washington states, the situation is highly different than the system in British Columbia. In both Sausalito, California and Lake Union, Washington, floating homes are taxed as personal property and handled in the same fashion as real property. In Seattle, for example, the property (floating home) is assessed at a percentage of its market value and the mill rate levy is then accordingly applied to determine the amount of taxes owing. Important, in the U.S. situation, in assessing a floating home is the determination of the square footage of living space as well as other factors such as an evaluation of the overall condition of the structure.

3.3 Licensing

In municipalities and cities consulted in this study, the response to the situation of being unable to directly tax floating home residents has led to a variety of strategies being employed to recover revenue. The City of Vancouver for example, under its Licence By-Law No. 4450 imposes a licence fee schedule on live-aboards and floating homes located within the boundaries of the City of Vancouver.
The fee structure appears to reflect an amount generally equivalent to what taxes normally would be assessed. A schedule of these fees is shown in appendix #1 and the procedures to be carried out pursuant to this by-law are contained in appendix #2.

Common to any of these afore-mentioned devices used to collect revenue for municipal coffers is the fact that although floating home residents are indirectly paying taxes to the municipality they receive none of the fringe benefits which usually accrue to other residents. The residents are not eligible for the Provincial Homeowners Grant or the Provincial Home Acquisition Grant. The Landlord and Tenant Act as well does not apply to floating home residents and moorage rates are left simply to the discretion of the marina operator.

This licencing procedure currently affects floating home residents located in Coal Harbour, and will be utilized in the Greater Vancouver Floating Home Cooperative ventures in False Creek and the proposed live-aboards communities at the Heather and Spruce Streets Marinas.

The Municipality of Richmond, as stated in the Richmond Marina Study of 1975 has proposed to implement a licencing scheme similar to that which is in effect in the City of Vancouver. The purpose again being to collect revenues which heretofore could not be recovered by conventional means.
3.4 Revenue Via Lease Agreements And Land Use Contracts

The District Municipality of North Vancouver has recently approved a floating home community at the foot of Pemberton Street. The situation existing in this particular location was that the municipality had title to the waterlot lease issued by the National Harbours Board. Premiere Module Structures, the proponents of this "Aquatic Village" development have, under conditions of the Sub-Lease Agreement between themselves and the municipality agreed to pay a "grant in lieu of taxes" amounting to approximately three hundred and ninety dollars per unit.¹ This figure is subject to tax increases that commensurate with general municipal tax increases specified in terms of the sub-lease agreement. This amount agreed to is comparable to taxes which would be paid by a land oriented dwelling unit occupying a lot equivalent to the outside area of the floating home units. It is interesting to note that in the case of this particular development another option was open to the municipality to collect revenues. Municipality, by virtue of its immediate zoning control over upland uses, could have, by way of the land use contract, entered into agreement with the developers to pay yearly fees as a condition of the upland development. The former option was chosen because the municipality saw the sub-lease clause

¹. Interview: Mr. Frank Ogden, Premier Module Structures January 12, 1977
giving them better control and would not mean implementing a by-law and going through a public hearing which is necessary under a land use contract.²

3.5 Taxation Legislation Implications

An attempt has recently been made by a member of the Provincial Legislature to bring floating homes within the authority of the British Columbia Assessment Commission making them taxable as improvements.

Mr. Steven Rogers, M.L.A. for Vancouver South introduced to the Provincial Legislature a Private Members Bill entitled the "Floating Homes Regulation Act." (No. M201) (see appendix # 3). The intent of this Bill would enable municipalities to excercise direct taxation over floating homes. Section two of this proposed Bill specifically states that "...a floating home situated within a Marina, whether or not the floating home falls within the definition of an improvement under the Municipal Act, Public Schools Act, Taxation Act, Vancouver Charter or any other Act, shall be deemed to be an improvement for the purpose of real property assessment and taxation under those Acts and, except as provided in Section three, shall be assessed and taxed in the name of the owner of the marina pursuant to the provisions of those Acts."³

2. Interview: Mr. Fred Squirreljonsson, Planner, North Vancouver District.

3. Section two of proposed Floating Homes Regulations Act 1977, No. M201
At the outset it appears that a legislative proposal such as that put forward by Mr. Rogers would in fact solve the existing difficulties of taxing floating homes. However, Provincial legislation may quite well run into numerous difficulties and shortcomings. "If Provincial Legislation attempts to regulate and/or tax a subject matter that can be characterized as one that also falls under the Federal power, and the Provincial Legislation conflicts with the Federal, then the Provincial Legislation will be declared inoperative." 4

It has been traditionally held that local harbour authorities have complete control over everything that goes on within their boundaries. Section 9, of the Harbour Commissions Act 1964-65 states that "subject to this Act, a Commission shall regulate and control the use and development of all land, buildings and other property within the limits of the harbour, and all docks, wharfs and equipment erected or used in connection therewith."

The Ontario Supreme Court however, in the case of the Hamilton Harbour Commissioners vs. the Corporation of the City of Hamilton et al., made judgement on November 29, 1976, that Hamilton Harbour was not a "federal enclave" and was therefore not entirely outside the scope of Provincial and Municipal legislation. Rather the land use control of the

harbour had both Federal and Provincial aspects. The City of Hamilton, the court ruled, could pass a zoning by-law affecting land use within the harbour so long as the by-law did not attempt to regulate or prohibit land uses for the purposes of either navigation or shipping. The court further declared that the Harbour Commission did not have exclusive jurisdiction over the harbour. Given the situation where floating homes are in an anomalous position of either being vessels or housing it may therefore be possible if floating homes are considered essentially as housing as opposed to vessels, that Provincial legislation can possibly be effectively used to control, regulate or tax floating homes. The regulation or control of floating homes is really an unoccupied field, therefore, Provincial legislation may not be repugnant to Federal legislation of either Harbour Commissions or other Port authorities.

It should be mentioned that this decision of the Ontario Supreme Court became available to the author only days before the final draft of this thesis was being prepared. The final status of this decision is not known at this time as to whether or not an appeal procedure has been undertaken by the Hamilton Harbour Commission. This decision has been included in the thesis however to indicate that local authorities may in fact possess more regulatory powers than have been previously thought.

A number of floating homes in Vancouver are registered
with the Ministry of Transport as non-propelled vessels under the Canada Shipping Act. It is clearly evident then, that if a floating home is registered as a vessel and the assessed tonnage tax has been paid it becomes doubtful whether tax legislation instituted at the provincial level would be enforceable against these vessels; as this action could possibly be viewed as infringing on Federal jurisdiction pertaining to shipping and navigation.

3.6 Registration

Paramount to the success of any taxation procedure directed toward houseboats is the implementation of an adequate registration system. Presently there is no central registry system pertaining to floating homes that would be necessary for taxation purposes if they were to become assessable as real property under the Assessment Act. This is due in part to the relative newness of this form of housing and to the limited numbers of people living on floating homes. Some float houses, as mentioned previously, are registered with the Ministry of Transport as non-propelled vessels, the primary purpose being for the owner to secure bank financing. Without being registered, lending institutions are extremely reluctant to make loans available. The reason for having a central registration system for floating homes would be to provide an accurate tracing of ownership in the event of nonpayment of taxes and to protect
prospective buyers against purchasing a unit where taxes are in arrears.

The proposed Floating Home Regulations Act, Section six specifies that marina operators will be responsible for maintaining a registry system for floating homes moored therein. The situation could occur, however, that a floating home unit may be sold prior to taxation and moved to another location. Also this system depends upon the integrity and diligence of a marina operator to record and maintain an accurate registry.

Section nine of the proposed Floating Homes Regulation Act provides that an owner of a floating home which is taxable under this Act and will be eligible for benefits under the Provincial Homeowner Grant Act and the Provincial Home Acquisition Act. However, under a system where there is no central registering it could become quite expensive to collect taxes from floating home residents in relation to the amounts of money in question. Taxes in many locations, it is assumed may be less than the amount of the homeowner grant which only requires a payment of fifty dollars to the municipality. If the floating home resident does not pay the fifty dollars the municipality loses the amount of the homeowner grant. It becomes necessary therefore for the collector to canvass floating homes individually collecting the fifty dollars from each home and a signature on the tax notice.
3.7 Multiple Taxation

The City of Vancouver currently imposes relatively high licence fees on marina operators where floating homes are situated. (see appendix 1) Richmond has also recommended the adoption of a similar strategy. In the event a provincial taxation strategy is adopted, it is only reasonable that these licence fees be reduced or terminated. A continuation of this practice would simply double taxation which would be reflected in floating home costs.

3.8 Municipal Attitudes Towards Floating Home Assessment

Local government officials may also argue that even if floating homes become assessable for taxation purposes they would generally tend to be a low assessment property that would not fully pay an amount in taxes commensurate with municipal service provision.

The assumption is generally correct that on a unit basis floating homes have market values lower than traditional single family dwellings. However, in the persuasion of this argument it should also be remembered that floating home communities are usually of such design that it is possible to achieve densities upwards of thirty units per net acre,* as opposed to traditional single family dwelling subdivision densities of approximately six to ten units per net

* Net Acre: 80% of gross acre allowing for adequate spacing of units walkways etc. Also assumes unit occupies approx. 1000 sq. ft. of water space.
acre. Therefore the aggregate total of assessable units would likely be as high if not higher than conventional subdivisions. Following along these lines it is also true that in the development of a floating community by the private sector, many of the services provided for the residents would be paid for and maintained by the development itself. In a comprehensive development, services such as internal water and sewer would be maintained by the operator, wharf lighting, garbage collection, snow removal from parking lots and walkaways would also be carried out by the operator. Some developments may also include recreation facilities for its residents, further reducing demand on public recreational facilities.

Local governments may argue that in the event floating homes become subject to direct taxation, their presence, after a number of years will result in a lower municipal assessment base. This argument is founded on the belief that floating homes will decline in value over a period of time. Evidence in Greater Vancouver indicates that this is not the case. Mrs. Sonja Johnson, former secretary of the Coast Floating Homes Association and Vancouver Floating Homes Cooperative, indicated in a recent discussion that good quality floating homes have generally appreciated in value over the past few years. This increase in value is based on simple laws of supply and demand. There are presently very few moorages permitting floating homes, while
there is a significant demand for these units where security of tenure is available.

3.9 **Recommendations and Conclusions**

**Taxation Legislation**

The approach taken to develop a provincial taxation scheme pertaining to floating homes is a positive approach. The proposed Private Members Bill No. M201 may, however, encounter difficulties arising out of the all encompassing definition used to describe a floating home. Section one of this Act defines "floating homes" as "a dwelling unit which floats or vessel which acts as a dwelling unit, and which is used as a temporary or permanent residence." The inclusion of the word "vessel" implies that a conflict of jurisdiction may arise between Provincial and Federal authorities.

As previously mentioned, vessels can be registered with the Federal Ministry of Transport as non-propelled vessels and if this is done the question arises as to whether provincial taxation legislation can indeed apply to a vessel that has registered and paid a tonnage tax to the Federal Government.

The difficulty with the proposed provincial legislation in its present format is the inclusion of both floating homes and live-aboards (live-aboards are generally recognized as sailboats and powerboats which people inhabit).
The definition of a vessel under the Canada Shipping Act, Small Vessel Regulations Section 2 (q) states that a "vessel includes any ship or boat or any other description of vessel, except a seaplane, used or designed to be used in navigation." The author is of the opinion that this definition does not include floating homes because they are not specifically used or designed to be used in navigation. Rather, their primary function is to provide housing accommodation. Therefore it appears that tax legislation may in fact be applicable to floating homes. Continuing with this in mind the Ministry of Transport may be registering floating homes as non-propelled vessels, when in actuality they should not be registered, under the intent and definition of this particular section. If this is the case, then the provincial statute would probably be valid for purposes of taxation of floating homes. It would be necessary for the Ministry of Transport to review its registration procedure and not include floating homes which are not truly vessels, but homes.

Legislation attempting to encompass both live-aboards and floating homes appears contentious regarding the live-aboard component due to the possibility of conflict of jurisdiction regarding taxation of registered vessels. It does in any event appear quite possible that a provincial statute is implementable that deals specifically with floating homes as defined in this paper.
Licencing

If and when direct taxation procedures become available via provincial enabling legislation it is recommended that those areas which are levying licencing fees as a method of revenue collection reduce or eliminate these methods. A continuation of this practice would simply constitute double taxation.

Registration

Necessary to the successful operation of taxation and assessment legislation would be the adoption of an appropriate registration system. The Bill presently before the legislature places the onus on the marina operator to keep an up-to-date registry but for reasons discussed earlier this system would be inappropriate. The Provincial Government in its throne speech January 1977 gave evidence that they will be undertaking to establish a centralized mobile home registry. The similarities between mobile homes and floating homes would suggest that floating homes could be incorporated into this registration system. Having floating homes in a central registry system would also be of benefit as the registry could provide market price information which would be valuable for assessment purposes.
CHAPTER FOUR
FLOATING HOMES: ASPECTS OF POLLUTION

A major concern about floating homes is they will pollute the waters on which they are located. Such pollution, particularly sewage undoubtedly affects local attitudes towards floating home developments. The three major sections of this chapter discuss powers to regulate pollution or required anti-pollution measures, the sources of sewage and alternative technologies for dealing with them. The conclusion is that there are, although not inexpensive, technologies available that can eliminate pollution problems associated with floating homes, and that these could be required in the Lower Mainland by a variety of legal techniques.

4.1 The Pollution Problem

Nearly all floating homes presently located in the Lower Mainland discharge wastes directly into the water. Marinas are often located in areas where the natural flow and turbulence of the water is relatively slight, and in any case the configuration of the marina itself tends to limit flow and trap floating debris. Thus sewage would often collect around the marina and dissipate very slowly, interfering with the natural treatment processes of dilution and biological reduction. If flotsam is allowed to collect
to an extent that substantially reduces sunlight penetration into the benthos it will also affect the normal exchange of gasses at the surface. A gas, hydrogen sulphide which has a very strong and distasteful odor is produced by organisms that grow rapidly in such conditions of low sunlight and low dissolved oxygen levels. Thus the problem of domestic waste pollution from floating homes is more than a matter of the quantity and biochemical qualities of wastes discharged into the water, as conditions around the homes are likely to exacerbate health and aesthetic consequences in the immediate area of these residences. These effects would also be hazards to swimming, boating or other recreational activities that otherwise might well be carried on in the same general location as a marina.

4.2 Legislative Controls

It is not certain that legislating enabling local governments to regulate the discharge of domestic wastes applies to homes floating over water. A basic determinant of the relevance of legislation depends upon which level of government, Provincial or Federal, has jurisdictional and proprietary rights.

"If we assume that the land underneath the water where houseboats are situated is the property of Canada, then British Columbia has no jurisdiction over this area. Under these set of circumstances nothing can be done to prohibit the houseboats from discharging human waste because there is presently no Federal legislation in existence dealing with this very point. If we assume that the land underneath the water where the houseboats are situated is the property of British Columbia, then it might very well be possible to prohibit houseboats from discharging human wastes. If we make the latter assumption, then it is submitted that the legislature of British Columbia has the authority to regulate the ultimate disposal of waste materials pursuant to the Health Act of British Columbia." \(^2\)

Based on this assumption of the land underneath being provincial property "amendments to the Act have been proposed by a Committee of Provincial and local authorities in order to clearly define comprehensive health standards for marinas. These amendments have yet to be adopted by the Province, however, they have been adopted by the City of Vancouver by resolution." \(^3\)

In order to successfully utilize provisions within the Provincial Health Act, which authorizes the Province to establish rules and regulations governing the disposal of sewage, it is necessary to determine the precise ownership of the land underneath the water. If these lands are deemed Federal then Provincial Legislation controlling waste disposal would be ineffective.

2. Stubbs, J.N. City of Vancouver Law Department "Opinion of applicability of Vancouver City Health By-Law and The Provincial Health Act to sewage disposal from floating homes." April 5, 1975

3. Richmond Marina Study 1975 Municipality of Richmond Planning Department, pp. 3
4.3 Regulation Via Lease Provision

Although not stated within terms of the lease agreement between the Province and the North Fraser River Harbour Commission, it is a matter of commission policy that all subleases granted by the commission shall agree to conform to Provincial pollution control regulations. The specific act referred to is the Pollution Control Act 1967, which states under section 5 that "...no person shall, directly or indirectly, discharge or cause or permit the discharge of sewage or other waste material on, in or under any land or into any water without a permit or approval from the Director." Using the provision within this Act it appears possible to control sewage disposal in those water controlled by the Province. This Act could therefore be used to effectively control floating homes waste disposal. Other leasing agencies, could as a matter of policy insist that marina leases either conform to the requirements of the Provincial Health Act in force or to the Pollution Control Act or both.

The question might also well be asked why the marina operators themselves do not undertake to initiate pollution control mechanisms. The reluctance results from a general uncertainties of leases being renewed and the possibilities that the adjacent upland areas may be rezoned and future development of the surrounding areas may preclude the marina

4. R.S.B.C. Chapter 34. The Pollution Control Act, 1967 Section 5
itself. If the leases are not renewed or a zoning change does occur the marina operator feels he may be left to pay for the expense of constructing a sewage collection system.

4.4 Methods of Sewage Disposal

With the adoption of adequate control mechanisms to inhibit the direct discharge of wastes from floating homes it follows that suitable collection and disposal systems and/or treatment systems must be instituted. The intent of this section will be to indicate systems which are available and discuss the positive and negative aspects of these options. It is not, however, the purpose to discuss these systems operations in great detail. Reference material specific to floating home waste disposal is quite limited. However, a report prepared by the United States Federal Water Pollution Control Administration, entitled Houseboat Wastes: Methods of Collection and Treatment June 1967, does give a good analysis of various systems which could possibly be used to dispose of floating home wastes. Much of the following discussion is based on this report.

Wastes emanating from floating homes are virtually the same as those which would be discharged from a land based dwelling unit. Toilet wastes are not the only water-carried discharge that causes public health and aesthetic concern, as liquids and suspended solids from kitchen sinks, baths and wash basins, and laundry fixtures must also be treated
to avoid environmental problems. It has been established that toilet wastes account for only approximately 38% of the volume of sewage discharged from residences.\(^5\) A satisfactory system for floating (or land supported) homes must provide treatment or collection of wastes from all four types of plumbing fixtures.

Any comprehensive method of waste collection may require that existing floating homes replumb in part or in whole the plumbing system. Systems currently utilized by many floating structures are simply vertical drains connected to the source and discharging directly into the water. Because of the structural restrictions and potential large costs involved in replumbing existing units it may be necessary to relax certain requirements of a plumbing code for these units only. Alternative construction techniques could possibly be derived which could be scrutinized on an individual basis.

4.5 Collection and Treatment Alternatives

It is technically feasible to provide either treatment or connections to sewers for a single floating home on site or as a single system serving a group of floating homes on an aggregated basis. Sewage collection and treatment on a group basis is almost invariably less expensive than individual units. In any case either connection to a shore

system or both primary and secondary treatment of wastes in a self operated marina treatment facility is highly desireable. "Connections to shore sewers, wherever possible, should be required to consolidate waste treatment responsibilities and regulatory control." The paper will now briefly describe the major types of treatment and collection systems, and significant advantages and disadvantages of each as related to floating homes.

4.6 Individual Methods

1. Macerator-Disinfector Toilets: Basically these units macerate and disinfects toilet waste prior to discharge; disadvantages of these units are: they do not provide secondary treatment needed to be operating adequately, they tend to have a short life span and need repairing frequently, only toilet wastes are treated, and the solid wastes may not be significantly reduced.

2. Incinerator Toilets: These units subject toilet wastes to gas incineration which produces an inert ash. The efficiency of these units is good with 100% removal of wastes, again though, only toilet wastes are treated, secondary treatment is not provided and the cost is relatively high when considering the degree of treatment provided.

6. Ibid pp. 47
3. Aerobic Treatment and Disinfection: Basically wastes are withheld in a tank for twenty four hours with artificial aeration, solids settle and chlorination of the effluent prior to discharge. The process is biologically simple but it has to be operating properly to be successful. Major drawbacks of these units are the large size, which in most floating homes would be oversized, the necessity of proper installation and maintenance and the relatively high cost.

In the "Aquatic Village" development in the Municipality of North Vancouver they have incorporated a completely self contained sewage disposal system. Basically, this system is comprised of a humus toilet which, through aerobic micro-organic decomposition reduces toilet waste to a humus material which need only be removed about once a year. Wastewaters from outer sources such as bathing, laundry and the kitchen are passed through a grease and soap interceptor which floats off the grease and settles out the soap. The water is then treated with iodine, prior to discharge, reportedly removes the majority of remaining contaminants.
4.7 Shore Treatment

There are two alternatives available if wastes are pumped to shore. The best and most acceptable choice is to connect directly with existing municipal sewers or if this is not possible to utilize a septic tank with absorption field. This latter alternative is not, however, recommended in urban areas where most communities have adopted a negative attitude towards the use of septic tanks.

Diagrams 1 and 2 illustrate the basic design of floats and integrated sewage disposal systems utilized in Seattle and proposed by the Coast Floating Homes Cooperative for possible use in the Vancouver area. Basically these two concepts employ a system whereby sewage is collected at a central lift station located in the marina which in turn pumps this sewage ashore to connect with the shore based sewer system.

4.8 Group Methods

If it is impossible to connect to and discharge into a shore based sewer, as an interim measure floating home communities could provide their own treatment facility. These units could be either land based or floating aeration or settling units treating the effluent with chlorine prior to discharge. The report by U.S. Federal Water Pollution Control Administration views this method only as an interim measure until such time connection can be made to onshore service.
DIAGRAM 2
PROPOSED DISPOSAL SYSTEM FOR VANCOUVER FLOATING HOMES

Collecting tank and pumping system, either in a float or a barge

Note: System to be built to the specifications of Seattle's Houseboat sewage system.

Flexible hose and coupling direct to floating home.

4.9 Additional Concerns

Another area of concern though not related to the direct disposal of sewage into the water is that of the effect that the units themselves have on benthic organisms. The issue is that floating homes when massed together effectively eliminate sunlight penetration to the waters below, having a deleterious effect on benthic organisms. The solution to this dilemma would be to ensure adequate spacing of units to allow light to diffuse down through the water to the bottom. Drift materials also tend to collect in confined placid water areas. However, if adequate spacing of units is provided for and floats are arranged in a manner non-condusive to materials collection this problem could be minimized. Another approach to alleviate drift materials collecting would be to have the connecting walkways and ramps raised above the waters supported by pilings. This would allow for materials to more readily pass through.

The leaching out of noxious materials such as lead used in non-corrosive protection paints also poses a potential harm to marine life. However, with the adoption of floatation devices constructed of fibreglass or ferro-cement this problem is minimized as these materials unlike wood do not need to be treated with non-corrosive paints. These types of floatation construction materials were endorsed by the Coast Floating Homes Association and subsequently the Greater Vancouver Floating Homes Cooperative.
4.10 Recommendations and Conclusions

With the difficulties local governments are currently experiencing in controlling sewage discharge from floating homes there are a number of strategies which could be implemented to ameliorate the situation. Following the lead of the City of Vancouver, other local governments could establish standards governing the waste disposal from watercraft moored at marinas within their jurisdiction. This would give local authorities direct control over the situation to ensure all local requirements are met. The difficulty in this approach is that if those waters over which standards are imposed and the land underneath the waters is the property of the Federal Crown there may be a conflict of jurisdiction negating some or all of those standards established. However, in waters owned by the province it appears possible that proper sewage disposal can be enforced through the Health Act.

A second procedure which could be adopted to control the disposal of untreated sewage from floating homes would be to include appropriate "purposes clauses" in the lease agreements administered by the water lot leasing agencies. Provisions in these leases either newly issued or renewed, would provide that marinas where floating homes are moored shall provide for the disposal of sewage as required by that particular municipality. In order to effectuate such a system it would be necessary to ensure the cooperation of
the local government concerned and the leasing agency.

Municipal governments also have the option to ensure new marinas or floating home developments install required sewage disposal facilities via the Land Use Contract. By virtue of their upland control, municipalities can negotiate that as a condition of the upland use that servicing be installed according to municipal specifications, to service the water portions of the development.

It is recommended that floating homes collect and discharge sewage into a municipal sewage system on shore. Adopting this policy would ensure that sewage treatment responsibility and regulatory control would be consolidated within the municipality. Although other systems either individual or group methods may be appropriate there still remains the possibility these systems may not be operating effectively.

It is recommended that floatation devices such as reinforced fibreglass or ferro-cement, which do not need non-corrosive paints be used. The use of these materials would reduce the effects of noxious chemicals leaching out and detrimentally affecting aquatic life.
CHAPTER FIVE
FLOATING HOMES: PLANNING CONSIDERATIONS

Many of the problems predominating the floating home situation are easily explained by the lack of, or inappropriate regulations governing their construction or location. If floating homes are to become a viable housing form it is necessary that appropriate considerations be given to criteria promoting quality construction and design in order to facilitate the incorporation of this residential form into the community as a whole. The intent of this chapter is not to specify rigid requirements or standards for floating homes, but rather to suggest guidelines and planning considerations, that need to be considered if and when governing agencies set out to prepare their own by-laws or regulatory devices.

A central issue regarding floating homes is their use of the water as a private use as opposed to a view held by many that waterfronts should be used for public purposes. Unfortunately there does not seem to be any effective means to alleviate this issue. In several cities this issue has been remedied to a certain degree by adopting a priority system of waterfront uses. First priority uses would include activities such as sport facilities, swimming, fishing, and boating. Second order uses may include restaurants, offices, hotels, parks et. which rely on but are not totally dependant
on the water for the activity to be successfully carried on.

The City of Seattle's Shoreline Master Plan states that "Floating homes and floating home moorages are water dependant uses and as such are preferred uses to occupy the surface of the water." Local governments should carry out similar procedures to identify priority uses for the waterfront (those which have a relation to the water) and in doing so investigate and assess possibilities of incorporating floating homes. A major objective of many waterfront planning programmes is to ensure that the area should be actively used and offer a variety of uses and opportunities. Floating homes are not envisioned as taking over and controlling vast expanses of shoreline but rather locating in a consolidated fashion. As such, their presence in appropriate locations could add another element to the diversity of the waterfront. At the same time they would be providing animation to the area on a twenty-four hour basis. A waterfront community sensitively designed could also serve to give a particular waterfront area a distinctive character. Character, for most waterfronts traditionally means tourist oriented-commercial districts.

With floating homes locating within close proximity to urban areas it can be argued that the social costs incurred by their development would not be as great should these same persons choose to live in suburban fringe areas. For example costs associated with transportation to urban
facilities is reduced, as well, the costs of providing services would be less as the bulk of services such as schools, shops, roads etc. are already in place. In offering this limited number of people the opportunity to live on the water also precludes the potential development or utilization of land 'simply for the purpose of housing.'

5.1 Locational Criteria

An important determinant of possible floating home locations is the nature of the water itself. This means that floating homes should be located in areas where there is minimal wave action which might possibly disrupt the units. This would preclude areas where the waters are unsheltered from the wind or from large waves emanating from the movement of ships or boats. It is also necessary that there is sufficient depth of water below the units to ensure they do not rest on the bottom in tidal waters when the tide ebbs.

Particularly important in the location of floating homes marinas, as well as marinas in general, is the aspect of potential conflict with upland uses. Upland residents traditionally lobby against any development which it is felt will detrimentally impact their views. In this regard, any comprehensive floating home community should either be located in a fashion so as not to pre-empt views or be designed in a manner which will reduce this conflict. As
mentioned earlier in this thesis the Municipality of North Vancouver is investigating the possibility of including provisions for a floating home community in the Seymour Planning Study. This is an example of the optimum condition, where a floating home community is coordinated in conjunction with planned upland developments. Other conflicting uses include those with commercial or industrial uses, which by their nature are not usually compatible with residential environments.

Local governments should also ensure that locations be adequately provided with municipal services such as water and sewer connections etc. and that these locations also be accessible to facilities such as schools, stores, parks and public transportation.

Consideration should also be given as to possible impacts such developments may have on traffic and circulation in and around the areas where they are located.

An important aspect involved in the selection of any location for a floating home community would be the necessity of an appraisal being undertaken to identify possible negative environmental impacts on water quality, benthic organisms or shoreline degradation.

Floating home locations cannot only be determined in terms of the concerns and aspirations of local government, but will also have to be evaluated in terms of priorities and concerns of agencies responsible for the management of the particular water body.
5.2 Floating home Marinas

Evidence from areas such as Marin County, California and Seattle, Washington suggests that floating homes should be located in moorages which cater specifically to floating homes. Both Seattle and Marin County have zoned specific sites for floating home moorages. This reduces possible conflicts between boaters and floating home residents, over matters such as noise disturbances and the different activities carried on by these two groups. A second option would be to include floating homes in a marina, however, a distinct separation or buffer zone should be provided to minimize potential conflicts. The principles of economies of scale suggest that moorages catering only to floating homes would be the best approach for economic purposes. The provision of a service infrastructure including sewage disposal would not be inexpensive, therefore it would be beneficial to have as many units connected to such systems as possible to reduce costs. In a mixed marina, catering to boats as well, the boats would be utilizing space but not paying for or needing the requirements instituted specifically for floating homes. Floating home marinas, because of their residential nature, need special considerations beyond those normally provided in recreational boat moorages.

Many communities have adopted policies to maintain street ends remain unencumbered by construction. In light of these policies, floating home marinas or any marina for
that matter should be designed or located to maintain these street-end views. Because of the attitudinal conflict which exists between public versus private usership of the water, provision should be made to facilitate public access for either active or viewing purposes, in floating home community developments. This could include the dedication of adjoining upland area for public access to provide visual or physical access to the water.

Traditionally the upland areas adjacent to marinas are used for parking purposes. In most cases these are simply wide open areas with no screening of these parking lots. It is suggested then that these parking areas, if possible be underground or landscaped and buffered to reduce visual impact.

Floating home marinas should incorporate into their design a servicing infrastructure which will adequately provide for electricity, water and the disposal of garbage and sewage. Sewage should be collected and pumped to existing onshore sewer lines. There are a number of other features which might also be included in a floating home moorage such as the provision of recreation facilities, laundromats, and internal landscaping. In Marin County, newer moorages under construction have planted shrubs and trees in wooden receptacles along the walkways. Details such as this add to the aesthetic appeal of the entire environment.
Important not only in upland residential developments but in floating home marinas as well is the provision of adequate open space. The total coverage of both floating homes and walkways should be such that it allows adequate spacing of units for fire protection purposes and will also allow sunlight penetration to the units and the water surface. Open space should also be provided for, as as to enhance views from the units to the surrounding waters and secondly the open space would tend to reduce the cluttered visual appearance from upland areas.

Rather than delving into a great description of various considerations which should be taken into account to ensure a well serviced floating home marina, appendices 4 and 5 are provided for this purpose. These regulations developed in Seattle, Washington, and Marin County, California appear to represent the state of the art of the various aspects of floating home marinas which should be regulated and controlled. These ordinances were set out to ensure floating home marinas would be developed to standards that will promote the safety and quality of lifestyle for the floating home residents. Moreover they strive to ensure developments which will integrate and be compatible with the community at large.
5.3 **Floating Home Units**

Respecting both the health and safety of floating home residents, it becomes necessary to adopt guidelines and standards regulating the construction of these units. Currently there are no building codes being enforced against floating homes. The Greater Vancouver Floating Home Cooperative has nonetheless recommended for the past few years that persons undertaking to build floating home units adopt Central Mortgage and Housing's "Canadian Code for Residential Construction". Elements of this code are recommended to be followed are those that relate to framing, wiring, plumbing, lighting, fireplace construction and flues, heating, cooking equipment and sanitation facilities.

Perhaps the most important component of a floating home unit is its floating foundation. Because of the multiplicity of superstructures that exist, the particular floatation system must be designed individually to suit the particular superstructure. This has to be done to ensure the stability of the unit under a variety of loading and climatic conditions.

The materials used for floatation purposes and the configuration of the floats are widely varied. Materials that have been used for floatation include logs, synthetic plastic materials including exposed plastic foam, fibreglass reinforced polyester resin shells. Other devices used are fibreglass coated plywood pontoons, prefabricated steel and aluminium floats, (coated with anti-corrosive chemical
solution) and ferro-cement floats.

Logs are not recommended for floatation because of their susceptibility to becoming waterlogged and/or becoming infested by torredo worms in a salt-water environment. Exposed plastic foam as well is not recommended because of its tendency to be easily damaged upon impact.

Fibreglass or fibreglass coated plywood pontoons have been used quite extensively in floating homes. These types of floats offer advantages because of cost, strength, longevity, low maintenance and their adaptability to construction of the unit. These floats are, however, still susceptible to puncture and can be damaged by impact. Steel and aluminum floats although much more resistant to puncture or impact damage are susceptible to corrosive action. Paints or chemical coatings applied to these material to reduce corrosion can, however, leach out into the surrounding waters.

Ferro-cement floats are an option which is recommended for use. The materials are very resistant to puncture or impact damage, they have a long life with low maintenance and are not readily decomposed by chemical or galvanic action. These types of floats are usually only commercially available and are therefore more costly than the other materials previously mentioned.

The Greater Vancouver Floating Homes Cooperative highly recommends the use of either ferro-cement or fibreglass coated pontoons for floatation purposes and does not recognize
or endorse plastic foam or log floatation.\textsuperscript{1} Of basic importance to the overall design and performance and safety of a floating home unit is its stability under varying physical conditions. Both the floatation device and superstructure must be designed so as to ensure the unit will remain stable under differing internal loading conditions or from external forces such as wave and wind action. The determination of whether or not a unit will maintain adequate freeboard or have minimal list can only be determined by calculating the stability factors for every different unit. Marin County, California has developed procedures for calculating the minimum floatation and stability requirements. These calculations are provided in appendix 6. Similarly because of the aquatic nature of the floating home environment Marin County has developed an electrical code specifically for floating homes. A copy of this code is contained in appendix 7.

As discussed at the outset of this chapter the purpose has been to discuss various considerations that should be taken into account if considering developing floating home regulations. For purposes of brevity appendices 8 and 9 are provided to indicate those standards and codes which have been developed in other areas relating to floating homes and floating home marinas. It is not intended they be followed

\textsuperscript{1} Interim Standards for Floating Homes Coast Floating Home Association, document 0043, October 1973 pp. 1 & 2
or adopted verbatim, but rather used as guidelines to suggest standards which have been seen as being essential to maintain minimum standards for safety, health and residential satisfaction.
CONCLUSION

The primary purpose of this thesis has been to provide an overview of the floating home phenomenon and discuss the major issues and implications involved in their development. Floating homes, in the context of this thesis are not seen as being a panacea to housing problems, nor as providing housing for relatively large numbers of persons. Floating homes do appear, nonetheless to provide an alternative lifestyle and mode of accommodation for a number of people. In light of this factor, and in terms of the often stated housing goal of providing for a diversity of lifestyle choices and housing options, floating homes should be viewed as another option to satisfy this goal.

There are, however, a number of problems identified and discussed in this thesis which both the citizenry, government officials, and floating home residents themselves have determined as being obstacles towards the integration and acceptability of floating homes as a legitimate and viable alternative housing form. This thesis has addressed the three most common concerns expressed in relation to floating homes; these being jurisdictional controls, difficulties of taxation and assessment and pollution. For each of these issues recommendations or strategies have been proposed that are directed towards alleviating the particular
concern. These possible remedies have ranged from controls implemented at the local level to ones incorporating intergovernmental involvement and cooperation.

The final section of this thesis has dealt with those elements of planning that should be considered and incorporated into regulatory mechanisms established for floating homes and floating home marinas.

Within the existing framework and status of jurisdictions governing the waters in the Vancouver area it is nonetheless possible to effectively control and regulate floating homes. Due to the National and local interests involved in both the development and management of the water in the Lower Mainland area it is felt that management mechanisms should incorporate and facilitate these varying interests. The comprehensive system proposed here, however, can only be accomplished in a situation of cooperation among senior and local government agencies and officials. As well, the concerns of floating home residents need also be taken into consideration.

With Federal government agencies administering the majority of waterlot leases for marine related uses, the inclusion of appropriate "purposes clauses" within new or renewed lease agreements can ensure that local by-laws or resolutions respecting floating homes are carried out. The procedure would be for local governments considering the inclusion of floating homes as a waterfront use, to draw
up suitable by-laws or regulations and make these available to the pertinent leasing agency. The leasing agency, would then need only incorporate adequate purposes clauses within the lease agreements with developers or agencies to ensure that local aspirations concerning floating homes will be met.

The problems associated with taxation and assessment similarly can be overcome through the inclusion of appropriate clauses in lease agreements. Such clauses would make it necessary for a "grant in lieu" of taxes to be paid to the municipality for floating homes moored at the marina. Provincial legislation, making floating homes assessable under existing assessment legislation is perhaps the most favourable system to obtain taxation revenue. It will probably be necessary to establish that floating homes primarily serve as housing rather than "vessels", in order to avoid possible conflict with Federal legislation.

The concerns expressed over the pollution eminating from floating homes could also be overcome through the "purposes clause" approach or through controls exercised by local governments over the upland area. In any event, it is recommended that moorages catering to floating homes provide for the effective disposal of domestic wastes from floating homes. A sewage system which connects with the shore based system is the preferred mode of disposal as it ensures that the regulatory control, treatment and monitoring
responsibility would be consolidated within the municipality. Although other individual, on site, group disposal techniques are available, there still remains the possibility that these systems may not be operating effectively.

Floating homes, as has been mentioned in this thesis, currently do not have to comply with any type of building codes or standards. To ensure both the safety and well-being of these residents, appropriate construction standards should be adopted not only for the units themselves, but for marinas catering to a residential component.

This thesis, in its approach to the floating home topic has attempted to remain neutral in its position respecting either the acceptability or rejection of floating homes. Similarly the author has not attempted to identify or suggest locations in the lower mainland for potential floating home moorages. It is the opinion of the author that the acceptance of rejection of floating homes and the determination of possible sites has to be evaluated in terms of the priorities, aspirations and conditions prevailing in each community. Moreover the future of floating homes has to be evaluated not only in terms of local or municipal governments, they need also to be evaluated in reference to the objectives of the senior government agencies and corporations who are responsible nationally for the administration and management of the surrounding waters.
What this thesis has set out to do is to provide as an information source to the floating home situation so that when policy decisions are made, they will be made on an informed basis rather than in an uninformed, emotional, or Ad Hoc fashion.
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Mr. Charles Brooks, Regional Harbours and Wharves Administrator. Ministry of Transport.

Mr. Scott McLaren, Chairman, Fraser River Harbour Commission.

Mr. Ken McKewan, Chairman, North Fraser River Harbour Commission.

Dr. J. Oliver, Vancouver City Planning.

Mr. Frank Ogden, Premiere Module Structures.

Mrs. Sonja Johnson, Former secretary of Coast Floating Homes Association and The Greater Vancouver Floating Homes Cooperative.

Mr. John Winters, Richmond Floating Home Group.

Mr. Frank Siqurjonsson, Planner, District Municipality of North Vancouver.

Mr. Robert Fenton, President of Greater Vancouver Floating Homes Cooperative.

Mr. D. Hickley, Senior Planner - City of Vancouver Planning Department.

Mr. Ross Kembar, Architect, Birmingham, Woods Architects.

Mr. Alex Jamieson, Planner, Corporation of the Township of Richmond.

Mr. D. Bowden, False Creek Development Group.
APENDIX 1

CITY OF VANCOUVER
SCHEDULE A RE: LICENCE FEES CHARGED
TO MARINA OPERATORS (REVISED JAN. 1977)

<table>
<thead>
<tr>
<th>Marina Operator</th>
<th>$30.00 Per Annum, plus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$199.00 For each occupied live-aboard boat from 0-21 feet in length, plus</td>
</tr>
<tr>
<td></td>
<td>$232.00 For each occupied live-aboard more than 21 feet but not more than 31 feet in length, plus</td>
</tr>
<tr>
<td></td>
<td>$282.00 For each occupied live-aboard boat more than 31 feet but not more than 40 feet in length, plus</td>
</tr>
<tr>
<td></td>
<td>$348.00 For each occupied live-aboard boat which is more than 40 feet in length.</td>
</tr>
</tbody>
</table>

Source: City of Vancouver Licence By-Law No. 4450, Section 17AA.
Marina Operators

17AA. (a) The initial fee payable in each year for a marina operator's licence shall be calculated in accordance with Schedule "A" hereto, and shall be based on the number of occupied live-aboard boats at the marina during the preceding year.

(b) The initial fee shall be paid before January 31st of the licence year.

(c) The final fee payable in each year for a marina operator's licence shall be based upon the actual number of occupied live-aboard boats at the marina during the current licence year; PROVIDED, HOWEVER, that the sum paid as the initial fee pursuant to clause (a) hereof shall be a credit on account of the final fee; and PROVIDED FURTHER, that if the initial fee paid pursuant to clause (a) hereof exceeds the final fee, then the amount of the difference shall be refunded by the City to the marina operator.

(d) The final fee shall be paid before December 31st of the licence year.

(e) In each licence year every marina operator shall keep a record of each live-aboard boat at his marina, which record shall specify:
   (i) length of each such boat;
   (ii) the name of its owner.
   (iii) its name, if named;
   (iv) the number of days it is occupied as a place of abode.

(f) Every marina operator shall make available to the Chief Licence Inspector at all reasonable time the records described in clause (e) hereof.

(By-Law 4785, July 30, 1974)

Source: City of Vancouver Licence By-Law No. 4450, Section 17AA.
HER MAJESTY, by and with the advice and consent of Legislative Assembly of the Province of British Columbia, enacts as follows:

1. In this Act
"floating home" means a dwelling unit which floats or a vessel which acts as a dwelling unit, and which is used as a temporary or permanent residence;
"marina" means land and foreshore lease within the coastal waters or inland waters of Canada, occupied by any person, organization, yacht club, association, society or company, for the purpose of providing water lots for the accommodations of two or more floating homes and for imposing a charge or rental for the use of such water lots;
"water lot" means an area within a marina's water surface area for which an owner or tenant pays a charge or rental so that the owner or tenant may moor, or anchor a floating home;
"owner" includes a person in possession of a floating home under a contract by which he may become the owner upon full compliance with the terms of the contract;
"regulations" means regulations made by the Lieutenant-Governor in Council under this Act.

2. Subject to section 3 and 4, a floating home situated within a marina, whether or not the floating home falls within the definition of an improvement under the Municipal Act, Public Schools Act, Taxation Act, Vancouver Charter, or any other Act, shall be deemed to be an improvement for the purpose of real property assessment and taxation under those Acts and, except as provided in section 3, shall be assessed and taxed in the name of the owner of the marina pursuant to the provisions of those Acts.

3. (1) Notwithstanding section 2, where the owner of a floating home situated within a marina is not the owner of the marina, the floating home taxable as an improvement under section 2 shall be assessed and taxed pursuant to section 2
in the name of the owner of the floating home, and, for this purpose, the owner of the floating home shall be deemed to be an owner of an improvement within the meaning of the Municipal Act, Public Schools Act, Taxation Act, or the Vancouver Charter, as the case may be, and shall be liable for the taxes imposed thereunder.

(2) Where a floating home is assessed and taxed in the name of the owner of the floating home under subsection (1), that floating home shall not be assessed and taxed as an improvement in the name of the owner of the marina under section 2.

4. This Act does not apply to
   (a) Floating homes owned by the Crown or by a municipality and occupied by or on behalf of the Crown or the municipality,
   (b) floating homes which are held in storage or which form part of the inventory of a manufacturer or dealer,
   (c) floating homes, licensed and equipped to navigate coastal and inland waterways, that are occupied by a bona fide tourist and are situated within a marina for a period of less than sixty days, or
   (d) floating homes that are exempted by regulations.

5. The taxes assessed in respect of a floating home under section 3 are recoverable in any manner in which taxes are recoverable under the Municipal Act, Public Schools Act, Taxation Act, or the Vancouver Charter, but
   (a) the land and foreshore lease comprising the marina is not subject to tax sale or forfeiture, and
   (b) the arrears of taxes or delinquent taxes do not constitute a lien on the land or foreshore leases by reason of taxes assessed under section 3.

5. (1) The owner or operator of a marina shall, upon demand, furnish to the assessor having jurisdiction, or his agent authorized in writing, forthwith after a floating home is moved into, or out of, his marina.
   (2) In addition, to the information furnished under subsection (1), the owner or operator of a marina shall notify the assessor, in writing, forthwith after a floating home is moved into, or out of, his marina,
APPENDIX 3 Cont'd...

(3) The assessor, or his agent authorized in writing, may, at all reasonable times, enter a marina or floating home for the purpose of assessing the floating home and inspecting any records kept by the owner or operator of the marina.

7. For the purpose of carrying out the provisions of this Act according to their intent, the Lieutenant-Governor in Council may make such regulations and orders as are ancillary thereto and not inconsistent therewith; and every regulation shall be deed to be part of this Act and has the force of law; and, without restricting the generality of the foregoing, the Lieutenant-Governor in Council may make regulations and orders

(a) respecting the assessment and taxation of floating homes under this Act, including assessment and taxation for floating homes for part of a year, and amendment of the tax rolls accordingly,
(b) defining, for the purpose of the regulations, any word not defined in this Act,
(c) exempting a floating home, or any class thereof, from the provisions of this Act or the regulations, and
(d) generally respecting any other matter necessary to carry out the purpose of this Act.

8. Except where inconsistent with the provisions of this Act, the Municipal Act, Public Schools Act, Taxation Act, and the Vancouver Charter, as the case may be, apply, with the necessary changes and so far as are applicable, to the assessment and taxation of floating homes under this Act.

9. The owner of a floating home that is accessible and taxable under this Act shall be deemed to be an owner of a parcel of land within the meaning of, and for the purpose of, the Provincial Howe-owner Grant Act, and the Provincial Home Acquisition Act.
Section 21A.73 Floating Homes.

(a) General

1. Floating homes and floating home moorages are water dependent uses and as such are preferred uses to occupy the surface of the water. Such uses shall comply with the Floating Homes Ordinance (No. 96821) and the requirements of this Article.

2. Floating homes and floating home moorages are a permitted use only the US/LU and UR environments as provided in Table 3, and only on Lake Union and Portage Bay.

3. Floating homes shall not exceed 21 feet at the highest point measured from the surface of the water.

4. Floating homes shall not cover in excess of 1200 square feet of water area, inclusive of float, decks, and roof overhang.

5. Floating homes shall not be located or relocated in such a manner as to block the view corridor from the end of the dock or walkway. In the location and the design of a new or remodeled floating homes, views of the water for moorage tenants and the public shall be opened up and enhanced.
6. Floating homes shall not be located between the combined pierhead/harbor line and the Seattle Construction Limit Line in Lake Union.

(b) Replacement and Remodeling

The replacement, remodeling or new construction of a floating home at an existing moorage not meeting the lot coverage, open water, site area, yard, or location provisions of this Article shall be permitted if it results in no increase in the total float area as of the effective date of the adoption of this Article, and the height of the floating home does not exceed 16 feet.

(c) New Floating Homes and Floating Home Moorages

1. Minimum site area of an individual floating home shall be 2000 square feet.

2. Total water coverage of all floating homes and all moorage walkways (fixed or floating) shall not exceed 45% of the submerged portion of the moorage lot area.

3. Yards.

   a. The minimum distance between adjacent floating home floats or walls shall be ten (10) feet of open water.

   b. The minimum distance between floating homes on opposite sides of a moorage walkway shall be ten (10) feet, wall to wall.
c. The minimum distance between any floating home float or wall and any floating home moorage lot line shall be five (5) feet except when adjacent ot a public street right of way, a waterway or the fairway. A moorage walkway (fixed or floating) may abut upon the lot line.

d. Each floating home shall have direct access to a moorage walkway of not less than five (5) feet of unobstructed width leading to a street.

e. Each floating home in a floating home moorage shall abut upon open water at least twenty (20) feet wide and open continuously to navigable waters.

4. Public Access

Usable open space shall be provided on the upland portion of the site for regulated public access and shall be located so as to provide substantial visual acces to the water.
APPENDIX 6

FLOATING HOME STABILITY
CALCULATIONS

Marin County Code Chapter 19.18 specifies minimum floatation and stability requirements that must be met before permits can be issued for the construction of a floating home. This pamphlet has been prepared to provide a simplified step-by-step method of providing calculations for standard type hulls. If unconventional designs are to be used appropriate calculations will have to be prepared by an engineer or naval architect.

A. Materials and unit weight to be used for computing dead (D.L.) and live loads (L.L.)

1. The following weights have been provided to assist you in figuring dead loads. All weights given for wood are based on Douglas fir and have been broken down to pounds per linear or square foot. If other materials are to be used the following unit weights must be used.

   1. Douglas fir 32 lb. per cubic foot
   2. Redwood 27 lb. per cubic foot
   3. Pine 30 lb. per cubic foot
   4. Cedar 30 lb. per cubic foot
   5. Concrete 150 lb. per cubic foot
   6. Steel 470 lb. per cubic foot

2. Live loads are based on the following:

   a. First floor (deck) 20 lb. per square ft.
   b. Second deck attic or loft 10 lb. per sq. ft.

3. Exterior stud walls - Studs 16" on center (o.c.) 12.8 lb. per linear ft. + exterior wall covering (shingle or 3/8 plywood) 9.6 lb. per linear ft. + interior covering.

4. Interior stud walls - Studs 16" on center (o.c.) 12.8 lb. per linear ft. + wall covering.

5. Roof (fir)

   Sheathing - 2.5 lb. sq. ft.
   Roofing
      Wood shingles - 3 lb. sq. ft.
      Corrugated iron - 2 lb. sq. ft.
      Tar and gravel - 6 lb. sq. ft.
      Composition - 1 lb. sq. ft.
      Skylights - 5 lb. sq. ft.
6. **Beams**

- $4 \times 6 = 4.2$ lb. per linear ft.
- $4 \times 8 = 5.7$ " " "
- $4 \times 10 = 6.75$ " " "
- $4 \times 12 = 8.2$ " " "
- $6 \times 6 = 6.3$ " " "
- $6 \times 8 = 8.6$ " " "
- $6 \times 10 = 10.9$ " " "
- $6 \times 12 = 13.18$ " " "
- $6 \times 14 = 15.47$ " " "

7. **Decking** = 5 lb. per sq. ft.

8. **Sheathing**

- $1 \times 3 = .39$ per linear ft.
- $1 \times 4 = .547$ " " "
- $1 \times 6 = .86$ " " "
- $1 \times 8 = 1.13$ " " "
- $1 \times 10 = 1.45$ " " "

9. **Floor Joists, Railings, Rafters, Ceiling Joists, Etc.**

- $2 \times 4 = 1.2$ lb. per linear ft.
- $2 \times 6 = 1.9$ " " "
- $2 \times 8 = 2.5$ " " "
- $2 \times 10 = 2.9$ " " "
- $2 \times 12 = 2.5$ " " "

10. **Plywood** (fir)

- $1/4 = .8$ lb. per sq. ft.
- $9/16 = 1.68$ lb. per sq. ft.
- $5/16 = 1.0$ " " "
- $5/8 = 1.8$ " " "
- $3/8 = 1.1$ " " "
- $11/16 = 2.0$ " " "
- $7/16 = 1.3$ " " "
- $3/4 = 2.23$ " " "
- $1/2 = 3.5$ " " "

11. **Sheetrock**

- $1/2 = 2$ lb. per sq. ft.
- $5/8 = 2.6$ lb. per sq. ft.

12. **Permanent Fixtures** (Weights include all plumbing and vents)

- Shower enclosure - 150 lb.
- Bathtub - 350 lb.
- Water closet - 105 lb.
- Wash basin - 50 lb.
The step-by-step method of calculating floating home stability outlined below will provide all calculations required for a construction permit. When making application submit your calculations in the same order we have listed them, starting with B-1 below.

1. Loadings

<table>
<thead>
<tr>
<th>Item</th>
<th>Dead Load (D.L.)</th>
<th>Live Load (L.L.)</th>
<th>Distance from bottom of floatation to centroid of each item (L)</th>
</tr>
</thead>
</table>

- **a. Floatation**
  1. Sides, ends, bottom bulkheads etc. W fa L fa
  2. Ballast, if any W fb L fb
  3. Other

- **b. 1st Floor and/or deck**
  (taken from top of floatation to ceiling)
  1. Joists, beams, flooring, blocking and facia W la W lb L la
  2. Exterior walls and Interior walls W lb L lb
  3. Guard railing, etc. W lc L lc
  **4. Permanent fixtures**
    - Bathrooms W ld L ld
    - Kitchen W le L le
    - Heating W lf L lf
    - Hot water tank W lg L lg
    - Holding tank W lh L lh
  5. Ballast, if any W li L li

- **c. 2nd Floor and/or deck**
  6. Same as 1st floor (1 through 5) W 2a W L2 2a through W 2g L 2g
7. Ceilings from below if any-W 2h

\[ \text{L 2h} \]

d. 3rd Floor and/or deck

8. Same as 2nd floor
(1 through 7)

\[ W 3a \text{ through } \]
\[ W 3h \text{ through } \]
\[ W \text{ LL3} \]

\[ \text{L 3a through L 3h} \]

e. Roof

1. Joist, rafters, beams and roofing

\[ W \text{ ra} \]

\[ L \text{ ra} \]

2. Facia, other

\[ W \text{ rb} \]

\[ L \text{ rb} \]

\[ \text{Totals} \]
\[ \text{D.L.} \]
\[ \text{L.L.} \]

*Centroid (\( \star \))- As used herein is the point in height at which the hull, roof, furnace, rooms, ceiling, units etc. would balance if separated from the structure.

Example #1

Example #2

** For simplification you may determine and use in your calculations one centroid for the bathroom fixtures (toilet, washbasin, shower or tub) if close together in one room; one centroid for the kitchen equipment (cooking facilities, cabinets, sink, etc.) In all other cases as grouped in paragraph B-1 Loadings.
Ballast - All of the calculations are based on the assumption the floating home has been designed to float without a list. If ballast is planned to correct for an uneven distribution of weight, it must be shown on your plans and included in your calculations.

2. Line Load (PL)
   a. 1st Floor
      (Average width) (5 lb) = (x)lb. x width ft. if (x) is greater than 100 lb., use (x)/ft.
      if (x) is less than 100 lb. use 100 lb/ft.
   b. 2nd Floor
      (Average width) (2.5 lb) = (y) x width ft.
      If (y) is greater than 100 lb. use (y)/ft.
      If (y) is less than 100 lb. use 50/ft.
   c. Total line loads
      PL 1 = (100 lb. or (x)) (average length of 1st deck)
      PL 2 = (50 lb. or (y)) (average length of 2nd floor deck)

3. Center of gravity (CG): Take mass moments about datum line, such as bottom of floatation. Refer to Section B1 for computed deadloads, live loads, and distances from datum to centroid of each respective D.L. or L.L.
   C.G. = \( \frac{W_{fa} (L_{fa}) + W_{fb} (L_{fb}) + W_{la} (L_{la}) \text{ etc.}}{W_{fa} + W_{fb} + \text{WLL} 1 + W_{la} + \text{etc.}} \)

4. Center of buoyancy (C.B.): Taken from same datum as in Section B-3 for C.G.
   \[ \text{CB} = \frac{\text{draft}}{2} \]
   where draft may be found from the following equation.
   \[ \text{Fr} = \frac{\text{D.L.} + \text{L.L.}}{\text{dV}} = x \]
   \[ L \times W \times h = x \]
   \[ h = \frac{x}{L \times W} \]
   then \( \text{CB} = \frac{h}{2} \)
5. Moment of inertia of floatation area

The floatation area $F_a$ is the area encompassed by the water line around the floatation (fully loaded floating home).

Examples:

<table>
<thead>
<tr>
<th>Configuration of Floatation Area</th>
<th>$I_{Y_{1}} + LL$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a</strong></td>
<td>$I_{Y_{a}} = \frac{bd^3}{12}$</td>
</tr>
<tr>
<td><strong>b</strong></td>
<td>$I_{Y_{b}} = \frac{b(d^3 - d_{1}^3)}{12}$</td>
</tr>
<tr>
<td><strong>c</strong></td>
<td>$I_{Y_{c}} = \frac{1}{4} \pi b a^3$</td>
</tr>
<tr>
<td><strong>d</strong></td>
<td>$I_{Y_{d}} = \left(\frac{\pi r^4}{4} + \frac{\pi r^2 d^2}{2}\right) \delta$</td>
</tr>
</tbody>
</table>

* change according to number of floats

6. Metacentric height

\[a. \quad (MG) = \frac{W_s I_Y}{W} - L\]

where $W_s = \delta h$

\[I_Y = \text{(from B-5)}\]

\[W = DL + LL \quad \text{(from B-1)}\]

\[L = CG - CS \quad \text{(from B-3 & 4)}\]
7. **Freeboard** (Sec. 19.18.320 (b))

a. With D.L. only .......referring to Section 4 compute draft with D.L. only using

\[ F_v = \frac{D.L.}{64} \]

Then \( F.B. = \) (distance from bottom of floatation to top of deck or hull) - draft

b. With D.L. + L.L. .... use same draft calculated in Section 4

Then \( F.B. = \) (distance from bottom of floatation to 1st floor deck) - draft

Note: \( F.B. \) should allow for no inundation of the top of floatation or to any point which would let water into the hull.

8. **Stability with off center load** (Sec. 19.18.320 c)

a. Compute line load as in Sec. 2. \( PL_1 \) \( PL_2 \)

b. Using dead load and line load only, recompute the center of gravity (see Sec. 3) C.G.

c. Using dead load and line load only, recompute the center of buoyancy (see Sec. 4) C.B.

d. Compute a new metacentric height, based on dead load and line load only using a, b and c above (and referring to Sec. 6) \( M_G \).

e. Compute

\[
Mr = \frac{\bar{M}}{g} \cdot (B) \cdot \sin h^\circ
\]

\[
DL + \text{line load } DL + \text{line load } PL_1 + PL_2 + \text{etc.}
\]

Where: \( B = \) buoyant force = D.L. + Line Loads

\[ \sin h^\circ = 0.07 \]

This is the resisting moment based on dead load + line load and due to a \( h^\circ \) list.

f. Compute the overturning moment due to the applied line loads. For example, take a simple houseboat.

(See Fig. 1)
\[ M_C = PL_1 \left( \frac{a}{2} \right) + PL_2 \left( \frac{b}{2} \right) \]

D.L. + line

g. Compute \( \frac{Mr}{(DL + \text{line})Mo} = X \) if \( X \) is equal to or greater than +1.0, then craft is stable.

h. Angle of list: Solve for \( \theta \) using:

\[ \sin \theta = \frac{x'(Mo)}{MG(\theta)} \]

use \( x, Mo, MC, B \) from part e, f, & g above.

If list angle \( (\theta) \) causes the original freeboard (with list angle = 0°) to be reduced by more than 2/3, then more freeboard is needed.
9. Stability with wind load

a. \[ M_r = \overline{M_0} \cdot (B) \sin h^\circ \]

where \( \overline{M_0} \) = metacentric height (use same values computed in B-6)

\[ B = \text{bouyant force resisting dead load and live load} = D.L. + L.L. \]

(as computed in B-1)

\[ \sin h^\circ = 0.007 \]

b. \[ M_o = P \times A \times H \]

Where:  
A = the area exposed to the wind as shown in the example.  
The roof area is figured by using the height of the roof above the ceiling joists times the length of the roof.

\[ P = 8 \text{ lb. per sq. ft.} \]

H = the distance from the water line to the center of each total area \( \frac{1}{n} \) by the number of centers used.

Example #1

\[ \frac{M_r}{M_o} \geq +1.0 \]

Floating home is stable if value if greater than +1.0
SUMMARY SHEET

Ordinance: Sec. 19.18.330 "Calculations"

1. 19.18.330 (a)

\[
\frac{Mr}{Mo} = +1.0 \text{ feet, as calculated according to B-G}
\]

2. 19.18.330 (b)

List angle and freeboard: Calculations as per B-7 and B-8 (h) Angle of list should also be calculated as result of wind load.

3. 19.18.330 (c)

\[
\frac{Mr}{Mo} \geq +1.0, \text{ as calculated according to B-8}
\]

4. 19.18.330 (c2)

\[
\frac{Mr}{Mo} \geq +1.0, \text{ as calculated according to B-9}
\]

5. Calculations should also show that under all conditions of off-center loading or wind loading, that safe freeboard will exist such that water does not enter hull or floatation.
EXAMPLE CALCULATIONS

The following calculations are for a floating home having a hull 30' x 20' x 4' super structure 30' x 20' x 8' having a 3' hip roof. The weights under B-1 are approximate.

B-1 Loading

\[
\begin{align*}
W_{fa} &= 8910 \text{ lb.} \\
W_{fb} &= 500 \text{ lb.} \\
W_{la} &= 3074 \\
W_{lb} &= 4944 \\
W_{lc} &= 216 \\
W_{ld} &= 305 \\
W_{le} &= 590 \\
W_{lf} &= 225 \\
W_{lg} &= 380 \\
W_{lh} &= 350 \\
W_{2h} &= 3290 \\
W_{ra} &= 7744
\end{align*}
\]

\[WLL = 12000 \text{ lb.} \]
(at 20 lb. sq.ft.)

B-2 Line Load

\[PL_1 = 100 \times 30 = 3000 \text{ lb.}\]

B-3 Center of Gravity (C.G.)

\[
\begin{align*}
CG = & \frac{8910 \times 2 + 500 \times 1 + 3074 \times 4.4 + 12000 \times 4.4 +}
& \frac{4944 \times 7.7 + 216 \times 6 + 305 \times 7.5 + 590 \times 7.5 +}
& \frac{225 \times 8 + 380 \times 7 + 350 \times 2.5 + 3290 \times 12.3 +}
& \frac{7744 \times 13.5}{30528 + 12000} = \frac{281069}{42528} = 6.6
\end{align*}
\]

B-4 Center of Bouyancy (CB)

\[
\begin{align*}
CB = & \frac{\text{Draft}}{2} = \frac{1.1}{2} = .5 = 6" \\
Fv = & \frac{\text{DL} + \text{LL}}{64} = \frac{12528}{64} = 198.5
\end{align*}
\]
h = draft
h = \frac{Fv}{\text{Area bottom of Hull}} = \frac{664.5}{600} = 1.1

B-5 Moment of Inertia

I_y = \frac{bd^2}{12} = \frac{30 \times 20^3}{12} = 240000 = 20000

B-6 Metacentric Height (MG)

\text{MG} = \frac{W_y I_y}{W} - L = \frac{64 \times 20000}{42528} - (6.6 - .5)
= \frac{1280000}{42528} - 6.1 = 30.1 - 6.1 = 24

B-7 Freeboard (F.B.)

Draft using Dead Load (D.L.) only

Fv = \frac{30528}{64} = 477
x = \frac{x}{Fv}

h = x = \frac{477}{LxW} = .8 = 9.6''

FB Dead load only = 3.2'

FB Dead load and live load = 2.9'

B-8 Stability with Off Center Load

a. PL 1 = 3000 lb.

Substituting Line Loads for Live Loads

b. CG = \frac{2441467}{33528} = 7.2

Fv = \frac{30528 + 3000}{64} = \frac{33528}{64} = 523.8

h = \frac{523.8}{600} = .9 = 10''

c. C.B. = \frac{10}{2} = 5''
d. \( \frac{W_5}{W} = L = \frac{1280000}{33528} - (7.2 - 5) \)
\[ = 38.18 - 2.2 = 36 \]

e. Compute
\[ Mr = \frac{W_5}{W} (B) \sin \theta \]
\[ Mr = 36 \times 33528 \times 0.07 = 8490.5 \]

f. \( Mo = PL \left( \frac{a}{2} \right) \)
\[ Mo = 3000 \times \frac{10}{2} = 15000 \]

g. Overturning Moment
\[ \frac{Mr}{Mo} = \frac{8490.5}{15000} = 0.563 \]
Greater than 1. Therefore the craft is stable.

h. \[ \sin \theta = \frac{x (Mo)}{\frac{MW (B)}{36 \times 33528}} \]
\[ = \frac{84000}{1207008} = 0.07 \]
Freeboard reduced by less than 2/3 therefore stable.

B-9 Stability with wind load

a. \[ Mr = \frac{W_5}{W} (B) \sin \theta \]
\[ Mr = 24 \times 142528 \times 0.07 = 71447 \]

b. \[ Mo = P \times A \times H \]
\[ H = \frac{D_1 + D_2 + D_3}{3} \]
The roof area is figured by using the height of the peak above the ceiling joists x the length.

\[ H = \frac{12.4 + 6.9 + 2.9}{3} = \frac{22.2}{3} = 7.4 \]

A = 681 sq. ft.

P = 8 lb. per sq. ft.

\[ Mo = 8 \times 423 \times 7.4 = 25041.6 \]

\[ \frac{Mr}{Mo} = \frac{71447}{25041.6} = 2.8 \]

2.8 is greater than 1 therefore stable.
MARIN COUNTY
ELECTRICAL CODE INFORMATION
RELATING TO FLOATING HOMES
(ORD. 1875 & N.E.C.)

FIGURE 21

STAPLE CABLE AT EACH JOIST OR RUN THROUGH BORED HOLES. CABLE CAN BE RUN OVERHEAD THROUGH BORED HOLES OR FOLLOW A STRONG BACK AS INDICATED.

SEE NOTES PAGE 6.
FIGURE 22
FLOATING HOME FLOOR PLAN AND WIRING DIAGRAM

LEGEND
MARINA CORD #1 TO SERVICE ENTRANCE BOX #1
MARINA CORD #2 TO SERVICE ENTRANCE BOX #2
FIGURE #3
SCHMATIC FOR A 50 AMPERE SERVICE ENTRANCE AND DISTRIBUTION PANEL (SEE NOTE NO. 3, PAGE 6)

FIGURE #4
LINE DIAGRAM SHOWING BRANCH CIRCUITS, LOADING AND WIRE SIZE FOR FIGURE #2 AND #3

CIR. #1 SMALL APPLIANCE 2 #12 MIN. PLUGS ONLY - MUST PASS
THRU KITCHEN MAY EXTEND INTO DINING AREA

CIR. #2 SMALL APPLIANCE 2 #12 MIN.

CIR. #3 GENERAL LIGHTING 2 #14 MIN. ONE CIRCUIT

CIR. #4 GENERAL LIGHTING 2 #14 MIN. PER 500 SQ. FT.

CIR. #5 SEWAGE EJECTION PUMP & BILGE PUMP 2 #12 MAX. TOTAL 1 H.P.

CIR. #6 DRYER 3 #10

CIR. #7 WASHER 2 #12

CIR. #8 FURNACE 2 #12

NOTE: ALL ABOVE CIRCUITS MUST HAVE A GROUND CONDUCTOR.
The load calculations and distribution of load for each leg in the distribution panel depicted in figures #2, #3, and #4 are shown below. For further information on calculations and method of computing the loads see Marin County Ordinance 1675.

The floating home is 20' x 40' and has two portable appliance circuits, a 700 watt washer, 4700 watt dryer, 700 watt furnace, 500 watt ejection pump and a 500 watt bilge pump.

**Lighting and small appliance load**

- **Lighting** - 20 x 40 x 3 equals 2400 watts
- **Small appliance** - 1500 x 2 equals 3000 watts

**Total** 5400 watts

First 3000 watts at 100% = 3000 watts

**Remainder** (5400 - 3000 = 2400 at 35%) = 840 watts

**Total** 3840 watts

3840 x 230 = 16.7 amperes per leg

700 watt (washer) ÷ 115 = 6 amperes

4700 watt (dryer) ÷ 230 = 20.4 amperes per leg

700 watt (furnace) ÷ 115 = 6 amperes

1000 watt (ejection and bilge pumps) ÷ 115 = 9 amperes

<table>
<thead>
<tr>
<th>Lighting and Appliances</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washer</td>
<td>6</td>
<td>---</td>
</tr>
<tr>
<td>Dryer</td>
<td>20.4</td>
<td>20.4</td>
</tr>
<tr>
<td>Furnace</td>
<td>6</td>
<td>---</td>
</tr>
<tr>
<td>Ejection and Bilge Pumps</td>
<td>---</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>49.1</td>
<td>46.1</td>
</tr>
</tbody>
</table>

The current required to satisfy the demand is under 50 amperes per leg. Therefore, one (1) 50 ampere supply cord, 50 ampere service entrance equipment, and a 60 ampere distribution panel can be used as specified in Marin County Ordinance 1675. If the demand is greater than 50 amperes per leg, additional equipment will be required. (See Note #3, page 6 and Figure #6.)
FIGURE 6

SCHEMATIC FOR SERVICE ENTRANCE BOX #2 AND DISTRIBUTION PANEL #2 (FOR A DEMAND GREATER THAN PROVIDED AT A SINGLE DOCK SIDE RECEPTACLE)

MARINA CORDS RATED FOR LOAD

CIR. #2-2 (30 AMP)
CIR. #2-4
CIR. #2-6

DISTRIBUTION PANEL #2

CIR. #2-1 (40 AMP)
CIR. #2-3
CIR. #2-5

CIR. #2-1 ELECTRIC RANGE, 3 #8 WITH GROUND
ON

CIR. #2-2 WATER HEATER, 2 #10 WITH GROUND
ON
NOTES FOR FIGURE #1

Note #1 - Each floating home power supply cord shall be approved and have four (4) conductors, one of which shall be identified by a continuous green color with a yellow stripe. The attachment plug, connectors and mating receptacles shall be 3 pole 4 wire grounded types covered by American Standard C-73 attachment plug and receptacles.

Note #2 - The power supply cord shall be permanently attached to the distribution panel and a suitable strain relief device (clamp or equivalent) installed just forward of the panel to prevent strain on the terminals.

Note #3 - The floating home main circuit breaker shall be (2) pole, rated for not less than 50 amperes, the maximum calculated load, or the rating of the circuit breaker located on the dock, whichever is greater. If the demand is greater than the power provided at the dock side receptacle, two (2) service systems and cords will be required as depicted in figure #6. If a service panel is used having a disconnect switch and fuses, the fuses shall be rated for the load (not less than 60 amperes) and employ a single two (2) pole holder with appropriate main fuses (not less than 50 ampere). The main circuit breaker on fuses shall be marked "MAIN".

Note #4 - The distribution panel must be illuminated, readily accessible and have at least a 30-inch clear working space at the front.

NOTES FOR FIGURE #6

Note #1 - When two (2) power supply cords are installed, a disconnecting means shall be provided for each cord but may be combined in single equipment without electrical interconnection other than for grounding purposes. Branch circuit equipment may be combined with the disconnecting means as a single assembly, and designated as a distribution panel. Plug fuses and fuse holders shall be tamper-resistant Type "S" enclosed in dead front panels.
**MARIN COUNTY**

**INFORMATION RELATING TO ELECTRICAL WIRING METHODS, FLOATING HOMES**

<table>
<thead>
<tr>
<th>WIRING METHOD</th>
<th>Concealed in Finished Walls, and in Attics</th>
<th>* Exposed Dry Locations</th>
<th>Exposed to the Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concealed Knob and Tube</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Non-metallic Sheathed Cable</td>
<td>Yes</td>
<td>Yes-M.H./N.M.C</td>
<td>No</td>
</tr>
<tr>
<td>Metal Clad or Armored Cable</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>A.S.E. Cable</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>U.S.E. Cable</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>U. F. Cable</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Rigid Conduit</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Electrical Metallic Tubing</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* All cable below 7'6" must be protected from physical damage

**BRANCH CIRCUITS**

<table>
<thead>
<tr>
<th>Min. Wire Size (Copper)</th>
<th>Maximum overload protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gage</td>
<td>Amperes</td>
</tr>
<tr>
<td>#14 or #12</td>
<td>15</td>
</tr>
<tr>
<td>#12</td>
<td>20</td>
</tr>
</tbody>
</table>

General illumination, one circuit for each 500 square feet of living area for lighting and receptacles.

Not less than two circuits for plug receptacles in kitchen, dining room, family room, breakfast room, pantry, each circuit is limited to 6 outlets.

One 15 amp. W.P. receptacle located on the exterior may be connected to one of the above circuits.

Laundry separate circuit (one receptacle)

<table>
<thead>
<tr>
<th>Min. Wire Size (Copper)</th>
<th>Maximum overload protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gage</td>
<td>Amperes</td>
</tr>
<tr>
<td>#6 + Gd</td>
<td>50</td>
</tr>
<tr>
<td>#12 + Gd</td>
<td>20</td>
</tr>
<tr>
<td>#10 + Gd</td>
<td>30</td>
</tr>
<tr>
<td>#10 + Gd</td>
<td>30</td>
</tr>
<tr>
<td>#8 + Gd</td>
<td>40</td>
</tr>
<tr>
<td>#12 + Gd</td>
<td>20</td>
</tr>
<tr>
<td>#12 + Gd</td>
<td>20</td>
</tr>
<tr>
<td>6600-5500 watts</td>
<td>30</td>
</tr>
<tr>
<td>5500 watts</td>
<td>40</td>
</tr>
<tr>
<td>5500 watts</td>
<td>20</td>
</tr>
<tr>
<td>Dishwasher separate circuit</td>
<td>20</td>
</tr>
<tr>
<td>Disposal and furnace</td>
<td>20</td>
</tr>
</tbody>
</table>
ORDINANCE NO. 86521
AN ACT relating to and regulating floating home moorage, particularly in the areas designated as "Mobile Home Parks" and "Floating Home Moorage," providing for the establishment of certain minimum standards of physical facilities and for the approval of plans for floating home moorage; emergency legislation, and declaring an emergency.

1. Section 1.050 MOORAGE WALKWAYS. Every floating home moorage shall have firm and substantial walkways with a net width of not less than four (4) feet and extending from land to every floating home site in such moorage.

2. Section 1.070 FIRE PROTECTION. Every floating home moorage shall be provided with suitable fire extinguishing equipment as approved by the Lighting Utility.

3. Section 1.090 WATER SERVICE CONNECTIONS. Every floating home site shall have a lawfully installed water service connection, and all water service outlet connections and water service piping shall be constructed, installed, and maintained in accordance with the Building Code.

4. Section 1.100 GARBAGE DISPOSAL. Every floating home site shall be provided with adequate garbage storage, and no garbage or refuse shall be thrown or dumped into the waters.

5. The city council shall have the power to make such other regulations as may be necessary to carry out the provisions of this ordnance.

6. The provisions of this ordnance shall be enforced by the Director of Public Health in accordance with said Code.

7. Should any section, subsection, paragraph, sentence, clause or phrase of this ordnance be declared unconstitutional or invalid for any reason, such decision shall not affect the validity of the remaining portions of this ordinance.
Chapter 11.21
MARINAS

ARTICLE 11.21
REGULATION AND CONTROL OF FLOATING HOME MARINAS

11.21.010 Purpose.
11.21.020 Definitions.
11.21.030 seawage lateral for the col-
11.21.040 Sewerage. Each vessel accommodated at the
11.21.050 Mooring. The Harbor Master shall ensure that
11.21.060 Parking. Parking spaces shall be provided as
11.21.070 Applications.
11.21.080 Permits.
11.21.090 Appeals.
11.21.100 Plumbing. The plumbing of water, sewage, and

APPENDIX 4

PEDEAULT

128

SUPERVISORS

NO. 305

M A - C.

ORDINANCE NO. 1931
AN ORDINANCE OF THE BOARD OF SUPERVISORS OF THE
MORBAN COUNTY, PROVIDING FOR THE REGULATION AND
CONTROL OF FLOATING HOME MARINAS.

Chapter 11.21
MARINAS

ARTICLE 11.21
REGULATION AND CONTROL OF FLOATING HOME MARINAS

11.21.010 Purpose.

Hereby added to the Marin County Code, Chapter 22.71.020 (a) of the
Marin County Code.

Chapter 11.21
MARINAS

ARTICLE 11.21
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11.21.010 Purpose.

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ARTICLE 11.21
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Marin County Code.

Chapter 11.21
MARINAS

ARTICLE 11.21
REGULATION AND CONTROL OF FLOATING HOME MARINAS

11.21.010 Purpose.

Hereby added to the Marin County Code, Chapter 22.71.020 (a) of the
Marin County Code.
be smaller than No. 6.

No. 6. (b) MARINA AERIAL CONDUCTORS

No marina aerial conductor shall pass over a dock or slip, unless supported by fixed poles. Minimum elevation for conductors shall be at least mean sea level datum. Electric service between a pier or floating home and a dock shall be maintained between a suitable means provided for. Casualties. Aerial conductors shall only be used for primary service.

(2) PROTECTED AGAINST DAMAGE

When conductors are carried down a pole, the mechanical protection shall be installed to the point required to insure against physical damage but not less than 10 feet from the mean sea level datum.

(3) SERVICE CONNECTIONS

No service drop shall be made to floating homes with a demand of less than 110 amperes.

Cords which supply floating homes shall be of sufficient size to allow for extreme tidal changes with no strain on the connections. Liquid tight metal conduit shall be installed to allow for expansion and contraction of the marine environment, if applicable, to allow for extreme tidal changes with no strain on the connections.

B. CREW SUPPLIES

Wet locations. All supports, bolts, straps, etc., shall be of corrosion resistant materials, or protected against corrosion by approved corrosion-resistant materials. Wet locations. All supports, bolts, straps, etc., shall be of corrosion resistant materials, or protected against corrosion by approved corrosion-resistant materials.

(1) Wiring to service connection points

11.21.100. Fire Protection. "Unless a local fire agency has established more stringent standards, a Marina shall have a fire protection system consisting of at least two fire streams of 60 gpm each, connected to hydrants located within the Marina. Fire streams shall be connected to a box and nozzle adequate to supply streams of water to the above described areas under fire. Systems shall be designed to provide a minimum pressure of 30 psi at fire hydrants, under flow. Systems shall be designed to provide a minimum pressure of 30 psi at fire hydrants, under flow.

11.21.110. Solid Waste Disposal. A system for the disposal of solid waste originating at any Marina shall be approved by the County Department of Public Health. The responsibility of the Harbor Master shall be to allow the operation and the use by the public of these systems.

11.21.120. Permit Required. It shall be unlawful for any person to operate a Marina or set berths for moorage of transient vessels without first securing a valid permit as hereinafter provided.

(a) FORM-FEE. All applications for Marina permits shall be in writing and shall be certified as true by the applicant. The fee for a permit shall be $50.00 per berth, per berthing facility.

(2) CONTENTS OF APPLICATIONS. All applications shall be made in writing and shall contain the following information:

(a) The size and location and boundaries of the Marina for which the permit is sought.

(b) The number of vessels to be accommodated therewith.

(c) All provision that has been made for disposal of sewage by connection to an approved shoreside sewage disposal system;

(d) All provision that has been made for connection of shoreside utilities;

(e) Certification that all applicable zoning provisions will be observed;

(f) Plans for all improvements.

(g) Such other information as the Director of Public Works may deem necessary to effect the provisions of this chapter.

(3) Inspections—Revocation. If the Director of Public Works determines that a permittee is acting in contravention of any of the provisions of this ordinance, he may revoke the permit.

11.21.130. Permits.

(a) Form—Fee. All applications for Marina permits shall be in writing on a form supplied by the Marin County Department of Public Works and shall be accompanied by a fee in the amount of $50.00 per berth, per berthing facility.

(b) Contents of Applications. All applications shall, as nearly as is possible, contain the following information:

(i) The number of vessels to be accommodated therein;

(ii) Certification that all applicable zoning provisions will be observed;

(iii) Plans for all improvements.

(c) Term—Renewal. All permits issued hereunder shall be effective for a period of one year, provided, however, that any material change in the operation of the permittee shall require a new permit. The Director of Public Works may approve by written application a permittee for an additional period of a fee in the amount of $50.00 per berth.

(d) Posting. Permits shall be permanently posted, displayed, and maintained at a conspicuous location in the Marina.

(e) Termination of Permittee. The Director of Public Works may revoke the permit.

(f) Appeal. If the Director of Public Works determines that a permittee is acting in contravention of any of the provisions of this ordinance, he may revoke the permit. The Director of Public Works may revoke the permit.

(g) Appeal. If the Director of Public Works determines that a permittee is acting in contravention of any of the provisions of this ordinance, he may revoke the permit.

(h) Appeal. If the Director of Public Works determines that a permittee is acting in contravention of any of the provisions of this ordinance, he may revoke the permit.

(i) Appeal. If the Director of Public Works determines that a permittee is acting in contravention of any of the provisions of this ordinance, he may revoke the permit.

(j) Approvals. All applications submitted in writing shall be processed and approved by the Director of Public Works in the manner hereinafter provided.

(k) Appeals. In the event that any applicant or permittee is for any reason dissatisfied with the action of the Director of Public Works, he may appeal to the Board of Supervisors.

(l) Eminent Domain. The Director of Public Works may condemn any property, real or personal, required for the construction of public works, as provided by law.

(m) Construction. All Marinas presently operating shall apply for a permit within one month of the effective date of this ordinance. No permit shall be issued at any marina unless the Director of Public Works determines that the marina is in compliance with the provisions of this ordinance.

(n) Existing Marinas. The Director of Public Works may issue a permit to any existing Marina which has been in operation for a period of one year from the date of application to comply with all of the provisions of this ordinance. The Director of Public Works shall have the authority to grant an additional permit for compliance on period in certain existing Marinas. Inevitably, that in their present form do not comply with the provisions of this ordinance, but are not considered to be unimportant or hazardous. Said permit to be approved subject to the conditions and all approval pursuant to Chapter 22.59.045 of the Marin County Code.

(ii) Section IX. Easements, Subsection (f), paragraph, sentence, clause or phrase or any reason held to be invalid or unconstitutional, such validity or unconstitutionality shall not affect the validity or constitutionality of any other portion of this ordinance, it being declared that this ordinance and each separate sentence, clause, phrase and paragraph thereof are adopted, irrespective of the fact that any other portion of this ordinance may be declared invalid or unconstitutional.

(iii) Section X. This ordinance is hereby declared to be an urgency measure and it shall be in full force and effect immediately.

Within fifteen days after adoption the same shall be published in the Independent-Journal, the newspaper of general circulation printed and published in the County of Marin, and in any newspaper of general circulation printed and published in the County of Marin, a newspaper of general circulation printed and published in the County of Marin, a newspaper of general circulation printed and published in the County of Marin. The conditions constituting such urgency are as follows: Maintenance and regulation of Marinas contrary to the provisions of this ordinance may create a nuisance and constitute a public health, safety, and general welfare hazard. Marinas which are not in compliance with all the provisions of this ordinance may be subjected to serious injury and illness.

The immediate operation of this ordinance is necessary to protect the public health, peace, safety and general welfare.

The foregoing Ordinance was passed and adopted at a regular meeting of the Board of Supervisors of the County of Marin, State of California, held on Tuesday, the 25th day of March, 1969, by the following vote:

AYES: Supervisors William A. Gnoss, Lt. Governor Michael Womum, John F. McInnis

NOES: Supervisors None

ABSENT: Supervisors None

Chairman of the Board of Supervisors

GEORGE N. GNOS, Clerk
No. 353 April 2, 1969
19.18.8.130. Piping—Drainage

19.18.180. Building Drain

19.18.190. Supply Cord

19.18.200. Second Supply Cord


19.18.010. Purpose. This ordinance is intended to protect the health, safety and welfare of floating home occupants by establishing the minimum structural, safety, health and sanitation standards for floating homes.

19.18.020. Definitions

(a) "Floating home" is any craft, craft, living accommodation or structure supported by a means of floatation, designed to be used without a permanent foundation, which is used or intended for human habitation.

(b) "Superstructure" is that portion of a floating home above the lowest deck or the level of floatation.

19.18.030. Ramps or Horizontal Exit Ways. Ramps shall be not less than 36 inches in width, exclusive of required handrails which shall not reduce the width more than 2 inches, shall have a minimum slope of 1:12, and shall be provided with ramp illumination with minimum intensity of one foot candelas at floor level of ramp entrance.

19.18.040. Space Requirements. Floating homes presently in existence or at a stage of construction past framing shall be required to comply with the following space requirements:

19.18.050. Height. The budding height of a floating home shall not exceed two-and-one-half stories.

19.18.060. Material. All material, such as decking, siding and subflooring, which is subjected to moisture or water splash shall be of a type not adversely affected by moisture, or shall be treated.

19.18.070. Construction. Flooring, wall and floatation shall be designed and constructed by use of diaphragm walls in ... the superstructure acts as an independent unit and is not adversely affected by point reactions under the floatation.

19.18.080. Fuel

Dockside gas connections to floating homes shall be made with approved high pressure hose. Where a floating home is used in a manner that will not result in corrosion, it shall be wrapped and insulated as required by the Code.

19.18.090. Plumbing — General. The plumbing of all floating homes and dockside facilities shall comply with Chapter 10.04 of this Code except as hereinafter provided.

19.18.100. Plastic Pipe. Plastic pipe for use in piping of potable water supply shall be PVC type 2 high impact, schedule 40 pipe, having a bursting strength at 200 psi of 3000 psi. Cleaning and cementing of joints shall be as directed by the manufacturer.

Plastic pipe for use in drain waste and vent piping shall be ABS-DWV with the same wall thickness as that of ASA Schedule 40 pipe. Fittings shall bear the name of the manufacturer, company name or registered trade name, and other information as required by the manufacturer.

19.18.110. Pipe Size. Minimum pipe size required in all floating homes.

19.18.120. Inboard Sewerage Device. A sewage receiving tank and ejector device must be installed aboard every floating home. The tank shall have a nominal pipe size of 3 inches and connect to the local sewerage lateral system.

19.18.130. Piping — Drainage and Vents

19.18.140. Stack. Each floating home shall have a minimum of one three-inch stack.

19.18.150. Water Distribution. Water shall be piped to supply floating homes through flexible hose unless the hose is immersed in water or lashed on docks, piers, etc. Length of hose shall not be excessive.

19.18.160. Fuel

Dockside gas connections to floating homes shall be made with approved high pressure hose. Where a floating home is used in a manner that will not result in corrosion, it shall be wrapped and insulated as required by the Code.
2.18.280. General Appliances. All clothing, furniture, washtubs, refrigerators, ranges, central or room heating equipment, etc., and more circuits of adequate rating shall be required in accordance with the following:

(a) Portable appliances on a circuit, without the sum of rated amperes approaching the branch circuit rating for air conditioning equipment.
(b) The rating of a single portable appliance on a circuit with no other outlets shall not exceed 50 per cent of the circuit rating.

2.18.280. Receptacle Outlets. All nonmetallic outlet boxes used for the grounding type and must be installed in accordance with Chapter 2.18.270. Receptacle outlets shall be parallel bladed 15 ampere single or double, and shall contain a separately-grounding type outlet for each connected fixed appliance installed.

Except in the bath and hall area, receptacle outlets shall be installed at wall spaces two feet or more, and so that no point along the floor line is more than six feet horizontally, from the outlet in the floor, except as provided in the following. Receptacles located below window rails and spaces occupied by kitchen or wardrobe cabinets.

2.18.290. Wiring Methods and Materials. Excepet as provided in Section 6.18.290. Wiring Methods and Materials, all wiring methods shall be approved. Nonmetallic conductors and materials are acceptable only in compliance with nonmetallic sheathed cable. When used, type SE cable shall have a 10 ampere, 125 volt rating, or higher if required for the wire size employed.

3. Switches shall be rated as follows:

(a) Lighting circuit switches shall be based on load rating, or higher if required for the installation.
(b) Moer or other load switches shall have amperes or horsepower ratings or rating in kw for loads controlled. An "AC generator" of the type described in 6.18.260. shall control a motor 2 horsepower or less and a motor 2 to 6 horsepower over 80 per cent of the switch ampere rating.
(c) Up to 4 inches of free conductors shall be left in an outlet box unless conductors are being run to a lower junction box.

1. WIRING EXPOSED TO WEATHER,

(a) All outdoor wiring is exposed to moisture or physical damage. Therefore, it is recommended that rigid metal conduit or liquid tight flexible metal conduit be used for loads connected on the line side of 2 x 4 studs. However, if a cable or armored cable is used, the cable or armored cable shall be effectively bonded to the grounding means.
(b) Grounding conductors shall be connected directly to the feeder wiring to the service entrance equipment.
(c) Insulated neutral (ground) shall be insulated by means of a grounding conductor.
(d) All metal cabinets shall be grounded to protect personnel, equipment, and materials required by Chapter 10.18.04 shall be used in flexibly.

(a) Nonmetallic outlets boxes shall be used in conjunction with nonmetallic sheathed cable. A grounded circuit conductor may be solid or stranded.
(b) Nonmetallic cable located between 2 x 4 studs or more, if exposed, shall be protected by covering boards, guard strips, or conduit.
(c) Switches shall be connected to the service entrance equipment in accordance with the electrical circuit control panel, or disconnecting means.

2. The chassis, if metal, shall be grounded. The grounded conductor may be solid or stranded, nonmetallic conduit or armor, nonmetallic, or bare. The chassis shall be effectively bonded to the grounding means.

3. In the electrical system, these equipment outlets shall be effective. The grounding for the service entrance equipment shall be provided with a locknut in the service entrance equipment, and the feeder wiring shall be connected to the service entrance equipment.

4. All metal cabinets shall be grounded to protect personnel, equipment, and materials required by Chapter 10.18.04 shall be used in flexible steel conduit.

5. The green grounding wire shall be connected to the service entrance equipment in accordance with the electrical section wiring methods and materials, etc., shall be bonded to the grounding means.

6. In the electrical system, these equipment outlets shall be effective. The grounding for the service entrance equipment shall be provided with a locknut in the service entrance equipment, and the feeder wiring shall be connected to the service entrance equipment.

7. The green grounding wire shall be connected to the service entrance equipment in accordance with the electrical section wiring methods and materials, etc., shall be bonded to the grounding means.
19.18.300. Stability. The floating home shall be stable with both dead load and live load. The off-center loading shall be considered as applicable to the completed floating home, and shall consist of a maximum of 10% of the floating home's displacement in feet of width, whichever is greater, for each 5 ft. of width, but not less than 20 ft. of width, whichever is greater. The live load applied half way between the metacentric height and the forward edge of the deck, to one side of the floating home, shall not be taken about the centerline of the vessel. Stability, with the off-center loading applied, shall be tested on both sides of the longitudinal centerline of the completed houseboat, including dead load, and live load, but not off-center loading. The moment due to the wind loading shall be calculated as:

\[ M_w = \frac{P \times A \times H}{12} \]

Where:

- \( M_w \) = Wind heeling moment, in foot pounds.
- \( P \) = Wind pressure factor, in pounds per square foot in accordance with the following equation:
  \[ P = \frac{2000 \times w \times 1.2 \times 1.0}{12} \]
  where:
  - \( w \) = unit weight of sea water
- \( A \) = Area, in square feet, of the projected lateral surface of the vessel above the load water line. This surface includes the hull superstructure and other equipment that may be as bounded by railings and/or structural members.
- \( H \) = Height, in feet, to the center of the wind pressure center of the floating home.

19.18.330. Calculations by Engineer. Calculations by a qualified engineer shall be based on the following assumptions:

- The minimum requirements will be acceptable, and calculations shall be subject to the following proviso:
- The calculations shall be made with a list angle of not more than 4°.

19.18.340(c) calculations shall show:

- \( MR > 1.0 \) ft. or more

(b) With reference to Section 19.18.340(c) calculations shall show that as a result of the list angle caused by the off-center loading, said moment shall not exceed the allowable moment:

\[ MR = 0.9 \times \frac{F}{S} \]

Where:

- \( F \) = FLOATATION VOLUME
- \( S \) = STABILITYworkable volume

The maximum allowable distance between bulkheads is 8 feet 6 inches. No single compartment shall comprise more than 5% of the total available flotation volume.
b) HULL TYPE FLOA-

TION. The hull shall be fitted with at least one longitudinal bulkhead and two transverse bulkheads. All water shall be removed from the hull at the rate of at least 0.5 cubic feet per minute when empty, and when filled shall comply with the following:

1. The hull shall be secured to a minimum of two separate cleats or pilings.
2. The hull shall be fitted with a fixed fire extinguisher system capable of providing fire suppression.
3. The hull shall be provided with a means of entry and egress for emergency purposes.

The Director may waive any of the foregoing requirements upon application and after investigation, provided that he finds that the vessel or equipment is suitable for use.

c) SUITABLE ACCESSIBLE STORAGE. Suitable accessible storage shall be provided on deck for the storage of life preservers, rings, life jackets, and other approved life saving devices.

No vessel shall be moored in a location which is hazardous to the health, welfare or safety of the occupants thereof or the community in general.

d) HOLDING TANK. Floata-

tion and decking shall provide access to and protection for the holding tank and sewage pump.

e) CONTINGENCY. All applications shall be accompanied by an fee in the amount of $60.00.

f) Cause or allow a vessel located on or moored to his property to be occupied in con-

travention of this chapter for any period, the Director, after investigation, determines that suitable provision has been made for the disposal of sewage and connection of shore-side utilities.

The foregoing Ordinance was passed and adopted at a regular meeting of the Board of Supervisors of the County of Marin, State of California, held on Tuesday, the 10th day of December, 1965, at the courthouse in San Rafael, Marin County, California.

This Ordinance is hereby declared to be an urgency measure and shall be in full force and effect immediately upon its adoption. The immediate operation of this ordinance is necessary to protect the public health, peace, safety and general welfare.

The foregoing Ordinance was passed and adopted at a regular meeting of the Board of Supervisors of the County of Marin, State of California, held on Tuesday, the 10th day of December, 1965, by the following vote:


NOES: Supervisor Thomas F. Tietenhofen None

This Ordinance shall be in full force and effect immediately upon its adoption. It is declared to be an urgency measure and shall be in full force and effect immediately upon its adoption. It is declared to be an urgency measure and shall be in full force and effect immediately upon its adoption.

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