British Columbia Float Home Standard

BRITISH COLUMBIA

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Float Home Committee Members and the Organizations They Represented

Committee Member	Organization
Gerry F. Buydens, P.Eng. (Chair)	Building Standards Branch - Ministry of Municipal Affairs
Robert G. Allen, P.Eng.	Society of Naval Architects & Marine Engineers
Frank Archer, President	Float Home Association (Pacific)
Nigel Beattie	Office of the Fire Commissioner
Henry Boas	Ministry of Environment, Lands & Parks
Robert Carson, Past President	Float Home Association (Pacific)
John Chace	Building Officials' Association of B.C.
David Chesney, Chief Inspector	Township of Langley
Barbara Dalrymple, MAIBC	Architectural Institute of B.C.
Don Cutler, Manager	Permits & Licenses - City of Richmond
Ivor Killacky, P.Eng.	Safety Engineering Services - Ministry of Municipal Affairs
Joanne Moore	Float Home Association (Pacific)
Frank Nardi, Regional Inspector	Canada Mortgage & Housing Corp.
Phil Oldham	Association of Marine Surveyors of B.C.
John Rockingham, P.Eng.	Association of Professional Engineers & Geoscientists of British Columbia
S. Ross Rettie, P.Eng. Alternate Representative,	Association of Professional Engineers & Geoscientists of British Columbia
R.V. (Bob) Switzer, Director	Permits & Licenses City of Richmond
Dan Wittenberg, President	International Marine Floatation Systems Inc.

Preface

This Float Home Standard covers the design and construction of float homes as defined within the standard, and the need for fire protection of both the float home and the marina in which the float home is moored.

Some discretion will be necessary when enforcing these requirements for float homes not located in a marina.

This standard does not include a water craft designed or intended for navigation. Codes and standards referenced in this standard are deemed to be the most recent version available.

Rationale for a Float Home Standard

The former Building Standards Branch of the Ministry of Municipal Affairs was asked to develop a standard or code that would cover the design and construction of floating homes.

Municipalities expressed concern that many float homes had inadequate safety provisions and that access too many sites was inadequate for ambulance crews and fire fighters.

There were two major problems facing the municipalities when they attempted to regulate floating homes or floating home villages. They often did not have jurisdiction over the area in which these floating homes were moored and there were no standards that covered the design and construction of floating homes.

Aquatic lands (land below the low water mark) come under the jurisdiction of the Ministry of Environment, Lands and Parks, except for those areas in which there are specific agreements which give the authority over these areas to others, such as the Federal Government or one of its agencies. Although municipalities do not have jurisdiction over the area in which float homes reside, they are still expected to provide emergency services such as fire fighting and ambulance service to these sites. In providing these services under poor site conditions, the municipality becomes concerned with the associated liability.

In order to regulate floating homes, the municipality must obtain the right to do so through an agreement with the Province or Federal Government agency. In the past, governing agencies have been reluctant to give authority to municipalities unless they were aware of the regulations that would be enforced because there were no recognized standards. This standard was developed to satisfy this requirement.

With the publication of this float home standard the municipalities can enter into an agreement with the governing agency which will allow them to enforce the float home standard. Float home occupants should thus be provided a reasonable level of safety.

Part 1 - Scope and Application

This standard applies to the design and construction of float homes. (See Part 5 for requirements governing existing float homes.)

Part 2 - Definitions and Symbols

The following definitions apply in this standard:

Authority having jurisdiction: the governmental body responsible for the enforcement of any part of the B.C. Building Code or the official or agency designated by that body to exercise such a function.*

Building: any structure used or intended for supporting or sheltering any use or occupancy.*

Building official: the person designated by the authority having jurisdiction responsible for the enforcement of the B.C. Building Code.

Buoyancy: the ability of the flotation system to support the displacement of the float home.

Damaged stability: the ability of the floatation system to support the dwelling unit and itself, when its watertight integrity has been breached.

Dead loads: the static, constant loads comprising the effects of the structure of the dwelling itself and furnishings, etc.

Deadweight (DWT): the total weight of all variables aboard; people, personal effects, stores, fuel, water, sewage holding capacity, etc.

Depth (D): the vertical dimension of the floatation device from top to bottom.

Displacement (W): the sum of lightship weight plus deadweight.

Draft: the vertical distance from the waterline to the bottom of the floatation device.

Dwelling unit: a suite operated as a housekeeping unit, used or intended to be used as a domicile by one or more persons and usually containing cooking, eating, living, sleeping, and sanitary facilities.*

Float home: a structure incorporating a floatation system, intended for use or being used or occupied for residential purposes, containing one dwelling unit only, not primarily intended for, or usable in, navigation and does not include a water craft designed or intended for navigation.

Freeboard: the vertical distance from the waterline to the top of the floatation device or the lowest opening into the floatation device.

GM: the vertical distance between the vertical centre of gravity (G) of the structure and the metacentre (M) of the floatation device.

Heel: the angle of inclination of the floatation device from horizontal, across the breadth.

Intact stability: the ability of the floatation system to resist overturning under influence of externally applied forces.

Land: includes the surface of water.

Length (L): the longest dimension of the floatation device parallel to the waterline.

Lightship weight (LW): the total weight of the float home (pontoon and dwelling together), fully furnished but without people, stores, personal effects, fuel or water, etc. on board.

Live loads: the dynamic, variable loads (basically attributable to deadweight items) used as design criteria for structure.

Local fire authorities: the fire department of the authority having jurisdiction.

Marina or float home moorage: a waterfront facility for the moorage of one or more floating homes and the land and water premises on which such facility is located.

Owner: any person, firm or corporation controlling the property under consideration during the period of application of this standard.

Pier: a structure extending into navigable water for use as a landing place or promenade or to protect or form a harbor.

Snow load: the maximum weight of snow which can be accumulated on the float home. The values for snow load shall be in conformance with the values established by the authority having jurisdiction or in the absence of such data, with the climatic values in Appendix C of the B.C. Building Code.

Trim: the angle of inclination of the floatation device from horizontal, along the length.

Walkway: a structure extending into navigable water used to accommodate pedestrian traffic other than a pier or wharf.

Waterplane: the total area of the floatation device in the plane of the water surface.

Wharf: a structure built along or at an angle from the shore of navigable water so that ships may lie alongside to receive and discharge cargo and passengers.

* These definitions are the same as those in the B.C. Building Code.

"NFPA" is the abbreviation for the National Fire Protection Association.

Part 3 - Technical Requirements

Section 3.1 General Requirements

3.1.1. Floatation and Stability

a) The floatation system shall be designed according to accepted marine engineering and naval architectural principles. The design shall be approved and sealed by a Professional Engineer qualified in such design.

b) The floatation device shall be durable and protected from deterioration by water, mechanical damage due to floating debris, electrolytic action, water-borne solvents, organic infestation or physical abuse. The design shall be approved and sealed by a Professional Engineer qualified in such design.

c) Where solid floatation devices are not used, adequate pumps shall be maintained in proper working order, and accessible sounding pipes shall be provided for each compartment.

d) A float home with a floatation device other than solid floatation shall be equipped with a bilge alarm system with detectors in each compartment with audible and visual alarm indicators in the float home.

e) The overall buoyancy and stability of the floatation device and superstructure shall be designed to accommodate local wind conditions and water turbulence, moving and launching, wave action, tides, loads imposed by vessels and walkways moored to the structure, live and dead loads and the possibility of water flooding associated with fire fighting.

3.1.2. Safety Equipment

Safety equipment within a float home shall include at least one buoyant throwing aid with at least 7.5 meters of line attached (e.g. a life ring conforming to Coast Guard small craft requirements).

Section 3.2 Design Standards for Flotation Devices for Floating Homes

3.2.1 Reserve Buoyancy Criteria

The floatation device shall have sufficient buoyancy to support the lightship weight of the float home plus the maximum combined weight of deadweight items and design snow load and maintain a minimum freeboard of 200 mm. The floatation device shall maintain a minimum freeboard of 400 mm under normal load conditions (the above noted loads minus design snow load).

3.2.2 Static Stability

The floatation device shall have sufficient stability in both the longitudinal and transverse directions to limit the amount of trim and heel resulting from wind forces to a maximum of one half of the freeboard at rest or 5 degrees, whichever is less. This can be established by application of a wind heel criteria as follows:

GM = PAH W tan (T) where P = 0.028 tonnes/sq meter A = projected area in sq meters of the portion of the float home (floatation system and superstructure) above the waterline H = vertical distance in meters from the centre of "A" to one half the draft T = 5 degrees or the angle of heel at which one half the freeboard is immersed, whichever is less.

3.2.3 Damaged Stability

The floatation device shall be subdivided by watertight bulkheads, have integral floatation material or employ alternate methods of limiting the ingress of water such that in the event of damage to any two adjacent compartments, the minimum freeboard of the floatation device after damage is not less than 100mm at any point. The initial load condition for assessing damaged stability shall represent the maximum normal load of the float home, but excluding snow load.

Section 3.3 Superstructure

3.3.1 Design and Construction

Float home superstructures and interior living areas shall be designed and built in accordance with Part 9, "Housing and Small Buildings," of the B.C. Building Code with the following exemptions:

a) Stairs providing a required means of egress from an area of not more than 40 sq m shall have a minimum clear width of 760 mm and the angle of inclination above the horizontal shall not exceed 50 degrees.

b) Guards are not required where open decks, balconies, and walkways do not exceed 1 m in height above the water line.

c) Fastenings in areas exposed to the elements shall be hot dipped galvanized steel, marine grade bronze, copper, stainless steel, or other corrosion resistant material suitable for marine use.

d) Additional structural specifications may be required for the design of the floatation system due to local wind and water conditions.

Section 3.4 Utilities

3.4.1 Electrical

a) Electrical work shall comply with the Electrical Safety Regulation.

b) Protection systems, such as grounding, shall be based on sound engineering practice and be in compliance with the Electrical Safety Regulation.

c) Where Quick Disconnect systems are used, they shall be based on sound engineering practice and be in compliance with the Electrical Safety Regulation.

3.4.2 Gas and Flammable Liquids

a) Lighting, heating and cooking systems utilizing either natural or liquid petroleum gases or flammable liquids such as gasoline, oil, kerosene and naphthalene shall not be permitted on float homes unless the design and installation of the entire lighting, heating and cooking systems have been inspected and accepted by the authority having jurisdiction.

b) The float home shall be fitted with a gas detector for liquid petroleum or natural gas with an audio-visual alarm interconnected with an electrical solenoid shut-off valve to stop the gas flow before it enters the float home.

c) Gas work shall comply with the Gas Safety Regulation.

3.4.3 Plumbing

a) Float homes shall be supplied with an approved source of potable water.

b) Float homes shall have a plumbing system which conforms to good engineering practices and is accepted by the authority having jurisdiction. Plumbing systems conforming to the B.C. Building

Code are acceptable.

c) Where a piped water supply is available, each moorage space for float homes shall be provided with a potable water connection.

3.4.4 Sewage Disposal

Float homes shall have, or be connected to, an approved sewage disposal system. Sewage disposal systems shall comply with the Sewerage System Regulation or the Municipal Wastewater Regulation.

Section 3.5 Float Home Fire Prevention Measures

3.5.1 Portable Fire Extinguishers

Placement of portable fire extinguishers shall be in accordance with Chapter 3 of NFPA 10, "Standard for Portable Fire Extinguishers." A minimum of one 2A5BC rated portable fire extinguisher shall be placed at the entrance/exit of each float home.

3.5.2 Fixed Fire Extinguishing System

Float homes, located in a marina, shall be protected in accordance with either Option 1 or Option 2 as detailed below, unless deemed to be unnecessary by the authority having jurisdiction.

Option 1

Float homes shall be protected by a fixed automatic sprinkler system installed in accordance with NFPA 13D, "Standard for the Installation of Sprinkler Systems in One-and-Two Family Dwellings and Mobile Homes."

Option 2

a) Wharves, piers and walkways serving the float home shall be constructed of totally non-combustible materials,

b) Wharves and piers shall incorporate a standpipe system installed in accordance with NFPA 14, "Standard for the Installation of Standpipe & Hose Systems" and

c) Fire fighting access to float homes must be acceptable to the authority having jurisdiction.

*Section 3.6 **Moorage** and Attachments*

3.6.1.

a) Float homes shall be moored in conformance with the Navigable Waters Protection Act.

b) Sufficient fastenings shall be available to prevent the float home from separating from the wharf, pier or walkway due to list, wind, or grounding.

Section 3.7 Access

3.7.1.

a) Each float home shall have direct access to an unobstructed walkway or pier leading to shore.

b) Piers and walkways shall be a minimum of 1.5 m in width.

c) Walkways shall have a non-slip surface.

d) Inclined walkways or ramps with a gradient exceeding 1:10 shall have handrails.

e) Accessible areas shall be illuminated to an average illumination level of 20 lux at walkway level with critical areas such as gates, ramps and safety stations being provided with 50 lux of illumination.

Part 4 - Marina Fire Protection

The float home marina shall meet the fire protection requirements specified in Sections 4.1 to 4.5 of this standard or the fire protection requirements specified in NFPA 303, "Fire Protection Standards for Marinas and Boatyards."

Section 4.1 Management

4.1.1 General Requirements

While design of the float home marina can reduce certain hazards, the fact remains that proper management of the facility is an important element for reducing the risk of fire and other hazards that threaten life and property. The following guidelines are specifically addressed to those management functions where implementation can significantly reduce the specific and overall hazard.

4.1.2 Fire Safety Planning

The marina owner shall adopt procedures to show that facility and equipment comply with the requirements of this standard and to show that maintenance and inspection functions are carried out as specified in this standard. As part of this function, all float home marinas with more than 2 units shall have a fire safety plan in accordance with the Fire Services Act and pursuant Regulations.

4.1.3 Fire Protection of Piers, Wharves and Walkways

Combustible piers, walkways and substructures in excess of 7.6 m in width or in excess of 465 sq m in area, or within 11.4 m of other structures or superstructures required to be so protected shall be protected in accordance with Section 3-3 of NFPA 307, "Standard for the Construction and Fire Protection of Marine Terminals, Piers and Wharves," unless the conditions in exception No. 1 or No. 2 exist.

Exception No. 1: In the case of fixed piers and docks, where the vertical distance does not exceed 0.91 m from the surface of mean high water level to the underside of the pier surface. In the case of floating docks, where the vertical distance does not exceed 0.91 m from the surface of the water to the underside of the dock surface.

Exception No. 2: In existing facilities, where the size of the facility and the adequacy of the water supply render fire protection specified in section 4.1.3 to be clearly impractical for economic or physical reasons.

4.1.4 Cleanliness

a) The facility shall be maintained at all times in a state of general order and cleanliness. The following list contains examples of conditions that shall be eliminated or controlled:
    i. Uncontained trash, wood scraps, sawdust, rags, etc.

    ii. Used engines and engine parts, miscellaneous metal, unused machinery, and similar items placed other than in a specifically designated and fenced area.

    iii. Open unused paint cans or other flammable fluid.

    iv. Spills of oil, paint or fuel.

b) Covered metal containers shall be provided at convenient locations in areas used for construction, service or repair for storage of oily and soiled rags and other refuse subject to spontaneous combustion. These containers shall be clearly marked as to their purpose and the contents disposed of frequently and in a safe manner.

c) Separate metal containers shall be provided in areas used for construction, service or repair for storage of sawdust, wood chips and other residue and trash that is not readily subject to spontaneous combustion. These containers shall be emptied frequently.

d) Covered containers shall be provided throughout the facility, including locations convenient to moored boats, for garbage and trash. These containers shall be located in areas where ignition of contents will not pose a hazard to the surroundings. Emptying and cleaning of these containers shall be performed regularly.

Section 4.2 Maintenance

4.2.1 General Requirements

a) A maintenance program that requires periodic inspection, testing and operation of fire fighting equipment and systems and that assures safe access to all parts of the facility for fire fighting personnel shall be adopted by the owner of the marina.

b) All fire fighting equipment and systems shall be inspected and tested at regular intervals by an independent agency acceptable to the authority having jurisdiction. As part of this requirement fire extinguishers shall be emptied at the end of their service period, preferably as part of a training exercise. Similarly, hoses shall be unrolled, inspected and tested (in accordance with the manufacturer's instructions) at least once a year.

c) Walkways, piers, access roads and other parts of the facilities shall be maintained free of obstructions at all times so as to provide safe and reasonable access to all parts of the facility by fire fighting personnel and equipment.

4.2.2 Fire Department Liaison

The owner of the marina shall assist the local fire authority in pre-fire planning for:

a) Entries and access routes for equipment within the premises,

b) Location, construction, use and accessibility of all float homes and all their subdivisions including storage lockers, etc.,

c) Location and extent of outside working areas,

d) Location and means of access to both dry and in the water boat storage areas,

e) Type and capacity of water lines on piers and walkways, including all points where connection of hydrant or pumper supplies can be effected,

f) Types and capacities of facility equipment, including work or tow boats, portable pumps, pier-mounted hose cabinets, all portable fire extinguishers, etc. and

g) Voltages and capacities of electrical systems and location of electrical disconnecting means.

Section 4.3 Fire Protection Equipment Installation

4.3.1 General Requirements

Due to the high concentration of combustibles and the presence of ordinary combustibles (Class A), flammable liquids, (Class B), and electrical (Class C) fire hazards in virtually every area of the facilities covered by this standard, the placement and maintenance of both fixed and portable fire extinguishing equipment are extremely important.

4.3.2 Planning

Careful planning in the placement of fire extinguishing equipment shall be made in cooperation with the local fire authority at least annually in order to accommodate changing conditions and personnel responsible for the fire control in the facility.

4.3.3 Portable Fire Extinguishers

Placement of portable fire extinguishers on piers and along bulkheads to which float homes or vessels are moored or may be moored shall be as follows:

a) Extinguishers listed for Class A, B and C fires shall be installed at each end of a pier and bulkhead that exceeds 7.6 m in length, and on piers exceeding 15.2 m in length, such that a distance of not more than 15.2 m separates extinguishers.

b) All extinguishers installed on piers shall meet the rating requirements set forth in Chapter 3 of NFPA 10, "Portable Fire Extinguishers," for ordinary (moderate) hazard type.

c) In vessel storage areas portable fire extinguishers shall be installed in aisle ways such that a distance of no more than 15.2 m need be traveled to reach an extinguisher (30.4 m maximum separation). The first extinguisher shall be installed at the entrance to each aisle way exceeding

7.6 m in length.

d) All portable fire extinguishers shall be maintained in accordance with Chapters 4 and 5 of NFPA 10, "Standard for Portable Fire Extinguishers," and shall be clearly visible and marked.

4.3.4 Fire Standpipe Systems (Applicable to piers and buildings on piers only)

a) Standpipe systems, when required, shall be installed in accordance with NFPA 14, "Standard for the Installation of Standpipe and Hose Systems."
Exception: Hose racks, hoses, and standpipe cabinets shall not be required on piers.

b) Buildings and buildings on piers shall be provided with standpipe systems.
c) Class II standpipe systems shall be installed on all piers in excess of 61 m in length extending from the shoreline.

d) Class III standpipe systems shall be installed on all piers in excess of 157.4 m in length extending from the shoreline.

4.3.5 Hydrants and Water Supplies

Hydrants and water supplies for fire protection in float home marinas shall be provided in accordance with NFPA 13, "Standard for Installation of Sprinkler Systems," NFPA 14, "Standard for the Installation of Standpipe and Hose Systems," and NFPA 24, "Standard for the Installation of Private Fire Service Mains and their Appurtenances."

Section 4.4 Maintenance of Fire Protection Equipment

4.4.1 General Requirements

Portable fire extinguishers, automatic sprinkler systems, standpipe systems and water supply facilities shall be maintained in accordance with NFPA 10, "Standard for Portable Fire Extinguishers," NFPA 13A, "Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems," NFPA 14, "Standard for the Installation of Standpipe and Hose Systems," NFPA 20, "Standard for the Installation of Centrifugal Fire Pumps" and NFPA 24, "Standard for the Installation of Private Fire Service Mains and their Appurtenances."

Section 4.5 Transmittal of Fire Emergency

4.5.1 General Requirements

All float home marinas shall have a means to rapidly notify the fire department in the event of an emergency. If a telephone is used for this purpose it shall be available for use at all times and shall not require the use of a coin.

Part 5 - Existing Structures

5.1.1.

Float homes which existed prior to the date of adoption of this standard by the authority having jurisdiction shall meet all of the following conditions:

a) The float home owner must provide proof of occupation and actual use as a dwelling unit prior to the date of adoption of this standard by the authority having jurisdiction.

b) The floatation system or device of the float home shall be certified by a Professional Engineer as providing adequate buoyancy.

c) The superstructure of the float home shall be certified as to its structural integrity by a Professional Engineer.

d) The internal layout of the float home, including physical, electrical, gas and plumbing arrangements, shall be certified by a Professional Engineer as to its integrity for the intended life of the structure. Proposals for equivalency shall be submitted to the building official for approval.

e) All chimneys, fire places and solid fuel burning appliance shall be inspected and accepted by the authority having jurisdiction as being in compliance with the B.C. Building Code in force at the time of installation.