

Standards for Float Homes
and Live-Aboard Vessels in
Victoria Harbour

Transport Canada

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Preface

This Standard identifies the safety and construction standards for new or existing live-aboard vessels and float homes, as defined within the standard, which are located within the limits of Victoria Public Harbour, Victoria, BC. The Standard also addresses the fire protection requirements for float homes and vessels converted to residences that are moored in the harbour.

The Standard is divided into three main sections according to the type of residence and vessel referred to:

Section 3: Float Homes

Section 4: Live-Aboard Vessels

Section 5: Vessels Converted to Residence

This Standard does not replace the Regulations or Standards of the Canada Shipping Act or any other applicable acts or regulations. Codes and standards referenced in this Standard are deemed to be the most recent version available.

The Standards were developed from the British Columbia Float Home Standard 1998, Building Policy Section, Ministry of Municipal Affairs., to reflect the jurisdiction and specific requirements of Transport Canada for Victoria Harbour.

These standards are applicable to all marinas and public port facilities in Victoria Harbour under federal jurisdiction. The standards may be augmented by additional requirements established by the marina or port operator.

Table of Contents

1.0 SCOPE AND APPLICATION.....	4
1.1 GENERAL.....	4
2.0 DEFINITIONS AND SYMBOLS.....	4
3.0 FLOAT HOMES.....	7
3.1 FLOAT HOME DESCRIPTIONS AND COMPLIANCE REQUIREMENTS	7
3.1.1 Existing Float Homes	7
3.1.2 New Float Homes	7
3.2 TECHNICAL	7
3.2.1 Electrical	7
3.2.2 Gas and Flammable Liquids	8
3.2.3 Plumbing	8
3.2.4 Sewage Disposal.....	8
3.2.5 Buoyancy Criteria.....	8
3.3 FLOAT HOME FIRE PREVENTION MEASURES.....	8
3.3.1 Portable Fire Extinguishers	8
3.3.2 Fixed Fire Extinguishing System.....	8
3.4 SAFETY EQUIPMENT.....	9
3.5 TECHNICAL REQUIREMENTS FOR NEW FLOAT HOMES	9
3.5.1 Construction	9
3.5.2 Stability	9
4.0 LIVE-ABOARD VESSELS.....	11
4.1 LIVE ABOARD VESSELS	11
4.2 TECHNICAL.....	11
4.3 UTILITIES	11
4.3.1 General.....	11
4.3.2 Sewage Disposal.....	11
4.4 FIRE PREVENTION.....	12
4.5 SAFETY EQUIPMENT.....	12
5.0 VESSELS CONVERTED TO RESIDENCE.....	13
5.1 VESSEL CONVERTED TO RESIDENCE.....	13
5.2 TECHNICAL.....	13
5.3 UTILITIES	13
5.3.1 General.....	13
5.3.2 Sewage Disposal.....	14
5.4 FIRE PREVENTION.....	14
5.5 SAFETY EQUIPMENT.....	14
6.0 MOORAGE AND ACCESS.....	15
6.1 MOORAGE AND ATTACHMENTS	15
6.2 ACCESS.....	15

1.0 SCOPE AND APPLICATION

1.1 General

This standard applies to the design and construction of *Float Homes*, *Live-Aboard Vessels*, and *Vessels Converted To Residences* moored within the limits of Victoria Harbour, Victoria, BC. The specific requirements for each class of vessel are described in separate sections of this Standard.

2.0 DEFINITIONS AND SYMBOLS

The following definitions apply in this Standard:

<i>Authority Having Jurisdiction</i>	- means Transport Canada or its authorized representative
<i>Beam (B)</i>	- means the maximum horizontal dimension of the flotation device normal to the length
<i>Breadth (Br)</i>	- means the maximum horizontal dimension of the <i>Float Home</i> or <i>Live-Aboard Vessel</i> , measured normal to the length. Note that the <i>Breadth</i> may not be equal to the <i>Beam</i>
<i>Building</i>	- means any structure used or intended for supporting or sheltering any use or occupancy
<i>Building Official</i>	- means the person designated by Transport Canada responsible for the application of the National Building Code
<i>Buoyancy</i>	- means the ability of the flotation system to support the displacement of the <i>Float Home</i>
<i>Damaged Stability</i>	- means the ability of the flotation system to support the <i>Dwelling Unit</i> and itself, and to prevent capsize of the <i>Float Home</i> when its watertight integrity has been breached
<i>Dead Loads</i>	- means the static, constant loads comprising the mass of the structure of the dwelling itself and furnishings, etc.
<i>Deadweight (DWT)</i>	- means the total mass of all variables aboard; people, personal effects, stores, fuel, water, sewage holding capacity, etc.
<i>Depth (D)</i>	- means the vertical dimension of the flotation device from top to bottom
<i>Displacement (W)</i>	- means the sum of <i>Lightship Weight</i> plus <i>Deadweight</i>
<i>Draft</i>	- means the vertical distance from the waterline to the bottom of the flotation device
<i>Dwelling Unit</i>	- means 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,

<i>Float Home</i>	- living, sleeping, and sanitary facilities - means a structure incorporating a flotation system, intended for use or being used or occupied for residential purposes, containing one <i>Dwelling Unit</i> only, not primarily intended for or useable in navigation, and does not include a water craft designed or intended for navigation
<i>Freeboard</i>	- means the vertical distance from the waterline to the top of the flotation device or to the lowest opening into the flotation device
<i>GM</i>	- means the vertical distance between the vertical centre of gravity (G) of the structure and the metacentre (M) of the flotation device
<i>Heel</i>	- means the angle of inclination of the flotation device from horizontal, across the <i>Beam</i>
<i>Intact Stability</i>	- means the ability of the flotation system to resist overturning under influence of externally applied forces
<i>Land</i>	- includes the surface of water
<i>Length (L)</i>	- means the longest dimension of the flotation device parallel to the waterline
<i>Length Overall (LOA)</i>	- means the maximum horizontal dimension of the <i>Float Home</i> or <i>Live-Aboard Vessel</i> measured parallel to the waterline
<i>Lightship Weight (LW)</i>	- means the total weight of the <i>Float Home</i> (pontoon and dwelling together), fully furnished but without people, stores, personal effects, fuel or water, etc. on-board (i.e. the Dead Load)
<i>Live-Aboard or Live-Aboard Vessel</i>	- means a vessel licensed or registered by Transport Canada as suitable for navigation which serves as a residence of its <i>Owner</i>
<i>Live Loads</i>	- means the dynamic, variable loads (basically attributable to <i>Deadweight</i> items) used as design criteria for structure
<i>Local Fire Authority</i>	- means the fire department of the <i>Authority Having Jurisdiction</i>
<i>Marina or Float Home Moorage</i>	- means a facility for the moorage of one or more <i>Floating Homes</i> or <i>Live-Aboard Vessels</i> and the land and water premises on which such facility is located
<i>Owner</i>	- means any person, firm, or corporation who controls the <i>Float Home</i> , the <i>Live-Aboard Vessel</i> Or the <i>Vessel Converted To Residence</i> under consideration during the period of application of this standard
<i>Professional Engineer</i>	- means a naval architect or marine engineer certified by the Association of Professional Engineers and Geoscientists of B.C. (in matters related to the flotation device and Marine Safety)

- Sewage* - means the definition of sewage under the Pleasure Vessel Sewage Pollution Prevention Regulations
- Snow Load* - means the maximum weight of snow which can be accumulated on the *Float Home* or *Live-Aboard Vessel*. 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 the National Building Code
- Trim* - means the angle of inclination of the flotation device from horizontal, along the length
- Vessel Converted To Residence* - means a vessel formerly licensed or registered by Transport Canada as suitable for navigation but which is no longer used nor licensed for navigation, and which has had its primary means of propulsion removed or rendered inoperable
- Waterplane* - means the total area of the flotation device in the plane of the water surface

Abbreviations

"NFPA" National Fire Protection Association.

"ABYC" American Boat and Yacht Council

"CSA" Canadian Standards Association

3.0 FLOAT HOMES

3.1 Float Home Descriptions and Compliance Requirements

3.1.1 Existing Float Homes

Existing *Float Homes* are *Float Homes* which existed prior to September 1, 2001.

Existing *Float Homes* shall meet all of the following criteria by June 30, 2002.

- a. The *Float Home Owner* must provide to the marina operator satisfactory proof of occupation and actual use as a *Dwelling Unit* prior to September 2, 2001.
- b. The flotation system or device of the *Float Home* shall be certified by a *Professional Engineer* as providing adequate buoyancy, stability, and structural integrity.
- c. The superstructure of the *Float Home*, including its means of attachment to the flotation system 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, solid fuel-burning fireplaces and appliances shall be inspected and accepted by the building official and shall meet or exceed the National Building Code in force at the time of installation.

Existing *Float Homes* shall meet all of the requirements of this Standard (excluding Section 3.5) by December 31, 2002.

3.1.2 New Float Homes

New *Float Homes* are *Float Homes* constructed after September 1, 2001.

New *Float Homes* shall comply with all requirements of this Standard (including Section 3.5) as a condition of occupancy of any Transport Canada operated or leased facilities in Victoria Harbour.

3.2 Technical

3.2.1 Electrical

Electrical work on a *Float Home* shall comply with the Canadian Electrical Code.

- a. Protection systems, such as grounding, shall be based on sound engineering practice and be in compliance with the Canadian Electrical Code.
- b. Where Quick Disconnect systems are used, they shall be based on sound engineering practice and be in compliance with the Canadian Electrical Code.

3.2.2 Gas and Flammable Liquids

- a. Lighting, heating, and cooking systems utilising 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 *Building Official*. All appliances must be CSA approved.
- 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 shutoff valve to stop the gas flow before it enters the *Float Home*.
- c. Gas work shall comply with the Gas Safety Act, and its pursuant regulations.

3.2.3 Plumbing

- a. *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 National Building Code are acceptable.

3.2.4 Sewage Disposal

- a. *Float Homes* shall have an approved on-board sewage disposal system.
- b. No discharge of *Sewage* into the waters of Victoria and Esquimalt Harbours is permissible.
- c. Sewage holding tanks shall comply with the Pleasure Craft Sewage Pollution Prevention Regulations.
- d. Marine sanitation devices certified as Type III devices by the United States Coast Guard are acceptable.

3.2.5 Buoyancy Criteria

- a. The flotation device shall have sufficient buoyancy to float upright, while supporting 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.
- b. The flotation device shall maintain a minimum *Freeboard* of 400 mm under normal load conditions (the above noted loads minus design snow load).

3.3 Float Home Fire Prevention Measures

3.3.1 Portable Fire Extinguishers

- a. Placement of portable fire extinguishers shall be in accordance with Chapter 3 of NFPA 10, "Standard for Portable Fire Extinguishers".
- b. A minimum of one (1) 2.5 kg ABC rated portable fire extinguisher shall be placed at the entrance/exit of each *Float Home*, and one (1) 2.5 kg ABC potable fire extinguisher shall be located at each level of the *Float Home*.

3.3.2 Fixed Fire Extinguishing System

Float Homes shall be protected as detailed below.

- a. *Float Homes* containing solid fuel-burning fireplaces and appliances shall be protected by a fixed automatic sprinkler system installed in accordance with NFPA 13 D,

"Standard for the Installation of Sprinkler Systems in One-and-Two Family Dwellings and Mobile Homes".

- b. Fire-fighting access to *Float Homes* must be acceptable to the *Authority Having Jurisdiction*.
- c. Means shall be provided to prevent down-flooding of the flotation device by activation of the sprinkler systems.

3.4 Safety Equipment

Safety equipment on a *Float Home* shall include at least:

- a. One (1) buoyant throwing aid with at least 7.5 metres of line attached (e.g. a life ring conforming to Coast Guard small craft requirements);
- b. One (1) rigid recovery aid, at least 3 m long (e.g. a pool side rescue pole or similar).

3.5 Technical Requirements for New Float Homes

3.5.1 Construction

3.5.1.1 Flotation Devices

- a. The flotation device shall be designed and constructed in accordance with sound engineering principles in order to satisfy the requirements of buoyancy and stability defined in this Standard.
- b. The flotation device shall be durable and protected from deterioration by water, mechanical damage due to floating debris, electrolytic action, waterborne solvents, organic infestation or physical abuse. The design and construction of the flotation device shall be approved and sealed by a *Professional Engineer* qualified in such design.

3.5.1.2 Superstructure

Float Home superstructures and interior living areas shall be designed and built in accordance with the National 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. Guard is not required where open decks, balconies, and walkways do not exceed 1 m in height above the waterline;
- c. Fastenings in areas exposed to the elements shall be hot dipped galvanised steel, marine grade bronze, or stainless steel. Additional structural specifications may be required for the design of the flotation system due to local wind and water conditions.

3.5.2 Stability

3.5.2.1 Flotation and Stability—General

- a. The flotation system shall be designed according to accepted naval architectural principles. The design shall be approved and sealed by a *Professional Engineer* qualified in such design.
- b. Where solid flotation devices are not used, adequate pumps or a manifold pumping

system shall be maintained in proper working order, with accessible sounding pipes and suctions provided for each compartment.

- c. A *Float Home* with a flotation device other than solid flotation shall be equipped with a bilge alarm system with detectors in each compartment with audible internal and external visual alarm indicators in the *Float Home*.
- d. The overall buoyancy and stability of the flotation device and the construction of the superstructure shall be designed to accommodate local wind conditions and water turbulence, moving and launching, wave action, tides, loads imposed by other vessels and walkways moored to the structure, *Live and Dead Loads* and the possibility of water flooding associated with fire-fighting.

3.5.2.2 Reserve Buoyancy Criteria

- a. The flotation device shall have sufficient buoyancy to float upright, while supporting 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.
- b. The flotation device shall maintain a minimum *Freeboard* of 400 mm under normal load conditions (the above noted loads minus design snow load).

3.5.2.3 Static Stability

The flotation device shall have sufficient stability in both the longitudinal and transverse directions to limit the amount of *Trim* or *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:

$$GM = PAH \div [W \tan(t)]$$

where P = 0.028 tonnes/square metre

A = projected area in square metres of the portion of the *Float Home* (flotation system and superstructure) above the waterline

H = vertical distance in metres from the centroid 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

W = the displacement of the *Float Home* in tonnes.

3.5.2.4 Damaged Stability

- a. The flotation device shall be subdivided by watertight bulkheads, or have integral flotation 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 flotation device after damage is not less than 100 mm at any point.
- b. The initial load condition for assessing *Damaged Stability* shall represent the maximum normal load of the *Float Home*, but excluding *Snow Load*.

4.0 LIVE-ABOARD VESSELS

4.1 Live Aboard Vessels

Live-Aboard Vessels shall meet all of the following conditions by June 30, 2002.

- a. The structural integrity, buoyancy, and stability of a *Live-Aboard Vessel* shall be certified as adequate for purpose by a *Professional Engineer*, or if a registered vessel by an accredited Marine Surveyor.
- b. Any chimneys, solid fuel-burning fireplaces and appliances installed after the date of original manufacture of the vessel shall be inspected and accepted by the *Building Official*.
- c. Any electrical, gas, and plumbing systems installed in a *Live-Aboard Vessel* after the date of original manufacture of the vessel shall be certified as being in accordance with the requirements of Transport Canada based on the requirements of the American Boat & Yacht Council (ABYC).

Live-Aboard Vessels shall meet all of the requirements in this Standard by December 31, 2002.

4.2 Technical

- a. *Live-Aboard Vessels* shall be demonstrated to possess structural integrity, buoyancy and stability commensurate with that required of licensed or registered vessels in Canada of like size and service, to the satisfaction of the *Authority Having Jurisdiction*.
- b. Where the authority has reason to question the adequacy or safety of the *Live-Aboard Vessel* it shall be inspected and certified by a *Professional Engineer*.

4.3 Utilities

4.3.1 General

All electrical, gas and plumbing systems installed in a *Live-Aboard Vessel* shall be certified as being in accordance with the requirements of Transport Canada Marine Safety Branch, Coast Guard, or the ABYC.

4.3.2 Sewage Disposal

- a. *Live-Aboard Vessels* shall have an approved on-board sewage disposal system.
- b. No discharge of *Sewage* into the waters of Victoria Harbour is permissible.
- c. Sewage holding tanks shall comply with the Pleasure Craft Sewage Pollution Prevention Regulations.
- d. Marine sanitation devices certified as Type III devices by the United States Coast Guard are acceptable.

4.4 Fire Prevention

- a. Each *Live-Aboard Vessel* shall be equipped with CSA approved fire extinguishers in accordance with requirements of Transport Canada Marine Safety for the class and size of vessel, one of which shall be located at the entry/exit of the vessel.
- b. Fire-fighting access to the *Live-Aboard Vessel* must be acceptable to the *Authority Having Jurisdiction*.

4.5 Safety Equipment

- Safety equipment on a *Live-Aboard Vessel* shall include at least:
- a. One (1) buoyant throwing aid with at least 7.5 metres of line attached (e.g. a life ring conforming to Coast Guard small craft requirements);
 - b. One (1) rigid recovery aid, at least 3 m long (e.g. a pool side rescue pole or similar).

5.0 VESSELS CONVERTED TO RESIDENCE

5.1 Vessel Converted to Residence

A *Vessel Converted To Residence* shall meet all of the following conditions by June 30, 2002.

- a. *Owners of Vessels Converted To Residence* must provide proof of occupation and actual use as a *Dwelling*.
- b. The structural integrity, buoyancy, and stability of a *Vessel Converted To Residence* shall be certified as adequate for purpose by a *Professional Engineer* or, if a registered vessel by an accredited Marine Surveyor.
- c. All chimneys, solid fuel-burning fireplaces and appliances shall be inspected and accepted by the *Building Official* and meet or exceed the National Building Code in force at the time of installation.
- d. Electrical, gas, and plumbing systems installed in a *Vessel Converted To Residence* shall be certified as being in accordance with the requirements of Transport Canada Marine Safety Branch, Coast Guard or the ABYC.

A *Vessel Converted To Residence* shall meet all of the requirements in this Standard by December 31, 2002.

5.2 Technical

- a. A *Vessel Converted To Residence* shall be demonstrated to possess structural integrity, buoyancy and stability commensurate with that required of licensed or registered vessels in Canada of like size and service, to the satisfaction of the *Authority Having Jurisdiction*.
- b. Where the authority has reason to question the adequacy on safety of the *Vessel Converted To Residence* it shall be inspected and certified by a *Professional Engineer*.

5.3 Utilities

5.3.1 General

All electrical, gas and plumbing systems installed in a *Vessel Converted To Residence* shall be certified as being in accordance with the requirements of Transport Canada Marine Safety Branch, Coast Guard, or the ABYC.

5.3.2 Sewage Disposal

- a. A *Vessel Converted To Residence* shall have an approved on-board sewage disposal system.
- b. No discharge of *Sewage* into the waters of Victoria Harbour is permissible.
- c. Sewage holding tanks shall comply with the provisions of the Pleasure Craft Sewage Pollution Prevention Regulations.
- d. Marine sanitation devices certified as Type III devices by the United States Coast Guard are acceptable.

5.4 Fire Prevention

- a. Each *Vessel Converted To Residence* shall be equipped CSA approved portable fire extinguishers in accordance with the requirements of Transport Canada Marine Safety that would apply to a registered vessel of that class and size, one of which shall be located at the entry/exit of the vessel.
- b. Fire-fighting access to the *Vessel Converted To Residence* must be acceptable to the *Authority Having Jurisdiction*.

5.5 Safety Equipment

Safety equipment on a *Vessel Converted To Residence* shall include at least:

- a. One (1) buoyant throwing aid with at least 7.5 metres of line attached (e.g. a life ring conforming to Coast Guard small craft requirements);
- b. One (1) rigid recovery aid, at least 3 m long (e.g. a pool side rescue pole or similar).

6.0 MOORAGE AND ACCESS

6.1 Moorage and Attachments

- a. Each *Float Home* or *Vessel Converted To Residence* shall be moored in conformance with the Navigable Waters Protection Act and in accordance with the direction of the operator of the moorage facility.
- b. Sufficient fastenings shall be available to prevent each *Float Home* or *Vessel Converted To Residence* from separating from the float due to list, wind, or grounding, yet should be of a type that can be readily disconnected in case of fire necessitating moving of the *Float Home* or *Vessel Converted To Residence*.
- c. *Live-Aboard Vessels* shall be moored to the satisfaction of the *Authority Having Jurisdiction*.

6.2 Access

- a. Each *Float Home*, *Vessel Converted To Residence* or *Live-Aboard Vessel* shall have direct access to an unobstructed float leading to shore.
- b. Walkways connecting to the float shall have a non-slip surface.
- c. Inclined walkways or ramps with a gradient exceeding 1:10 shall have handrails.