

**The Association of Marine Surveyors of  
British Columbia**  
**at**  
**The Floating Home Association Canada  
(Pacific) Annual General Meeting**  
**Ladner, 26-April-2014**

**Float Homes and The Marine Surveyor**  
**the Why, the What and the How**

A presentation by JT Ellis, Vice President, AMSBC and Registered Marine Surveyor, of Vancouver, BC

Ladies and gentlemen, members of the board, and guests, thank you for inviting me to address you today on behalf of the Association of Marine Surveyors of British Columbia, and as a Registered Marine Surveyor and principal of JT Ellis Marine Surveyors. I learned my trade in London with a British shipping company. I worked for them in London and throughout the UK, later as their representative in Vienna, and finally as a manager in their Hong Kong office. In 1976 I decided I would abandon shipping and travelled to Taipei where I worked for more than a decade superintending and assuring the quality of complex marine structures, and actively participating in the assessment of risk and elimination of loss amongst the cargo carriers of the worlds seaways. In 1993 my wife and I emigrated to Vancouver, where I continue to provide these services. Although, I have not lived in a float home, I have spent about seven years as a full time cruising live-a-board on yachts we have owned, and a further five years of so as a part-timer, in such divers places as the sweltering humidity of New Orleans and under rain clouds in the shadow of the Tower of London. I cannot say that floating homes are a commonly recurring subject of surveys, but there are enough of them that no self-respecting surveyor should undertake a survey of one without a clear understanding of how they are built and what forces come to bear upon them during their useful lives.

Phil Oldham was to join me here today, but the death memorial service of one of our fellow surveyors, Mr. Pat Patrick exerted a greater pull. Perhaps some of you knew him? Phil sends his regrets.

Your lifestyle is the envy of virtually everyone. Living on the water is symbolic of a particularly valuable freedom: that is the expression of ones individuality, it is the path less well trodden, and it places you on the world's oldest highways: the rivers, estuaries, and creeks of salt, brine and fresh water with hardly any of the downside associated with the other highways; which are

banal, dirty and intrusive and which we are forced to confront almost every day of our lives. I applaud you for all these reasons, and I'm sure that there are many more. Living in a floating home is not without its trials and tribulations and no doubt for every virtue that I have extolled there are moments when you wake-up ruing the day when you decided to bite the proverbial bullet!

Today, I would like to talk about the part we, as marine surveyors, can play in helping floating home owners enjoy their lives aboard at home with the least possible disruption. I am going to avoid the detail you can find in such documents as Part 11 of Schedule B promulgated by the City of Vancouver in favour of common sense and the experiences I can bring to the issues affecting floating homes.

We can safely split the subject into two parts: firstly the design, engineering and construction, and secondly their maintenance. Writing for one of your recent newsletters I outlined the differences between various styles and kinds of homes afloat so lets' start with a brief recapitulation of these: there are three kinds of floating abodes: the FLOAT HOME, meaning a structure incorporating a floatation system, and intended for residential use, but not intended for navigation. Float homes rely on an umbilical connection to shore-side utilities, and are permanently tethered to a fixed structure such as dolphins or piers. FLOAT HOMES are defined by the fact that they do not have a hull, but rely on flotation. FLOAT HOMES of a modern design rest on positive floatation and are often compliant with some sections of the BC Building Code. They are constructed to certain standards and are usually professionally designed, and may be engineered to meet pertinent zoning, codes and bylaws. Older FLOAT HOMES, for example, might be huts, houses and other structures placed on or built on flotation, such as, logs, plastic barrels, foam filled concrete caissons, sealed tubes, fibre-glass pontoons and such like, but not to accurate or compliant designs. Being "older" does not in itself indicate that a float home is unsafe, nor compliant, nor unsuitable for its intended purpose, merely that it can be hard work to quantify and qualify it.

The HOUSEBOAT, in this case a vessel converted into a home, or custom built for the purpose maybe engineless, but are usually suitable for limited navigation in protected waters. Good examples are narrow boats and converted barges. Houseboats may have on-board power generation equipment, water and sewage tanks, and those in use on Shuswap Lake are typical. The key difference between a FLOAT HOME and HOUSE BOAT is that the FLOAT HOME relies on flotation, while a HOUSE BOAT has a hull.

LIVE-a-BOARDS, the third class of floating home, are vessels suitable for navigation that are lived in, but are otherwise not modified and are as designed for their intended use, for example sailing yachts and motor vessels. They most often are self-contained, but may also be attached to the umbilical at marinas and along the rivers, lakes and along the coastal tidal waters everywhere, for example Spruce and Heather Marinas in Downtown Vancouver.

Now, the design of a FLOATING HOME is so important that it may well trump every other consideration. A professional designer: that is the architect, in concert with an engineer, will take the time to assess the environment, select the right materials, and define proper accommodation arrangements, services and utilities, for a long service life. This person, the artist, is the one who draws the beautiful lines that capture the essence of the life you aspire to. After all, owning a floating home is not simply about ownership it is the ability to live the way you want to. This is the person who brings together a working interior where the bathroom layout

actually works, and the galley is a place you want to spend time in rather than discussing whether or not the cat can be swung in it. It is the architect of your design who will consider longevity, servicing and maintenance, livability, and more crucially the issues of stability, and the ability of the homogenous structure to absorb the extreme loads associated with predictable weather and other less predictable events. You know the ones I mean, the one where a steel deck barge collides with your home afloat, a careless neighbour drops an extension cord into the water, electrifying the surrounding waters and every metal part of your houseboat below the waterline is consumed by electrolysis overnight, or when an extreme low tide leaves your home high, dry and stressed. Give the right designer the correct instructions, and pay him or her their due - you will never regret it.

Sometimes, the designer is the engineer, but if he is not then find one and verify that what is being proposed will fit the bill. The engineer's job is not about the art of design, it is about the mathematics of structure. If you dream of passionate evenings in the setting sun slurping marguerites in the roof-top hot tub whilst Charlie plays the piano in your upstairs living room, then you need an engineer before you build your dream. The greatest enemy of your floating home are patio gardens, hot-tubs, excessive weights in the wrong places, unsupported spans in open spaces, and the insanity that afflicts us all when it comes to things we don't understand such as electrical supply and water management. Let me also, in passing, mention snow, ice and hoarding.

Next there is the builder. The builder is only as good as the engineered design he has agreed to build. Now, please don't misunderstand me, there are builders who treasure their reputations and who would not even dream of altering a scantling here or saving a buck there by fitting an eight inch beam instead of a ten inch one, but these builders are rare and hard to find. Construction and engineering drawings are full of phrases that make sense in the context of the drawings, but which are open to broad interpretation on the ground: one of these is the term "... or equivalent"; which gives a builder and purchaser choice in selection of some materials and fittings. Beware of any decisions that are made without consultation between the builder, architect and engineer, and remember that a city inspector guarantees nothing and probably knows less about floating homes than you do - the inspector's job is merely to document particular compliance where it is required. Now that the costs of floating homes are approaching heights where the oxygen is thin you might also consider independent supervision. It is worth every penny and it should be accompanied by the copy of every material receipt, photographic records, regular reporting, and discussion with interested parties when deviation or change is needed. Independent supervision is not there to give you someone to blame in the event of the discovery of some future deficiency, the job of the supervisor is to make sure that everyone plays fair, by the rules you have agreed, and who will let you know when you need to get involved. My motto is "Doveriai no Proveriai", said to be the only three words of Russian that Ronnie Reagan knew, and it means "Trust but Verify". That is what you must do if you are to get what you want, and no one, no one at all can blame you for verifying your trust in them - after all the bank, the insurance company, your mortgage holder, in fact just about everyone expects it from you so why not between you and your architect, designer, engineer, builder and so on? If your builder says that independent verification is unwelcome or unacceptable then there might be a misunderstanding about the function and ultimate purpose of such verification; which can be resolved by debate. If after discussion the builder prohibits such verification then you must ask yourself why? Don't forget that the builder may also be contracting the work out - you have to know this, just as you must know that the correct materials are being used and if they are correctly assembled.

Now and again, you might find yourself dealing with a developer who has a stock offering. Make sure that you understand what it is that you are buying, who designed and constructed it, and the standards it is built to, what warranties there will be and how they work. Developers are rarely what they at first seem to be and their wares are often sold at arms length to protect them from any issues that arise with design and construction. Witness the great rain-screen debacle in Vancouver where thousands of purchasers of condominiums have had to foot expensive repair bills because they cannot legally reach out to the developers, builders, contractors and sellers of their flawed properties for restitution. Once again, beware of work that is sub-contracted, performed out of sight, or that is unsubstantiated by drawings, an engineer's report, a detailed quantity survey of materials, and so on. It is not enough to know that the material of the floatation is the best one, how the floatation is secured in place, and how the structure over is attached and finished are just as important. The greatest cost element in your floating home is that of labour, not the materials required for it's construction.

So, here we are, a year later. You followed good advice and all is well. Your floating home is afloat at last, coated with the correct paint, she sits firmly on her lines, the fasteners are the ones deemed best for the job, the pressure regulator on the water system functions properly, and the electrical panel has the appropriate fail safe mechanisms incorporated into it. Chains hang loosely from the corners attached to substantial hawsers, and you can hear the chuckle of the water as it gently ripples around you. Oops! There's a leak in a corner somewhere, but it is soon fixed, and finally you can sit back and contemplate the most extraordinary achievement of your life so far. One that is a source of pride to you, the envy of your friends and even your mum and dad seem to go along with it, with reservations of course.

What's next?

Well, hopefully, you've got a spread sheet or a log book already set-up that contains the lists of items that will require servicing and regular maintenance in the years to come. These innocuous recordings of events are very valuable to insurers, financiers, prospective purchasers, inspectors, surveyors and everyone associated with the value and service life of your houseboat. If your new investment is protected with Cloverdale Paint's very best, outside, oil-based exterior paint, then over coating it with their cheapest latex is a bad move. I would rate it right up there with removing the batteries from your smoke detector because it keeps going off. Take the information you have garnered about the materials used to build your floating home and list compatible products and most importantly develop an understanding of what it means to maintain and service things. If it is in your mind that your life afloat excommunicates you from the obligations of terrestrial home owners, then think again. You may not have a garden or a street in front of you, but your floating home needs you. When you bought your floating home you probably read the bit where it says "never needs maintenance" and "will last beyond the service life of the structure". Really? Just remember that expenditure of R&D in the floating home environment is based entirely on experience, some of it bitter and expensive. Be proactive and not reactive, make sure you know what is going on underneath your floating home. Plan ahead for emergencies such as exceptional low tides, spills of pollutants, leaks from above and penetrations from below. Think about how you might deal with emergencies and plan accordingly.

Now, you are OK. Your home floats serenely on her lines, but your neighbour lives on a home built long before standardization of the parameters for design and construction were

promulgated. I think for the purposes of our meeting here today that we can assume that your neighbour's home and many other floating homes just like it have received plenty of love, mostly well directed, over the years, but like so much in life, as one ages sometimes those devilish little details get left undone. What can go wrong?

Lets go back to my submission to your newsletter last year. The major issues are these:

- air filled and open topped floatation which requires constant monitoring and pumping
- buoyancy chambers engineered from wood, but not encapsulated, or logs, both prone to rot and water-logging
- inadequately sealed buoyancy chambers allowing water ingress, for example wet foam will deteriorate, and, because these void spaces are inaccessible, prone to flooding leading to instability
- hogging where the ends of the floating home droop, and sagging where the floatation is inadequate beneath the centre
- instability as a result of water-logging, or out-of-balance due to construction flaws, heavy peripheral weights high up on the structure, or a combination of all of the above
- compromised electrical service, usually as a combination of any or all of the following: inadequate grounding, lack of circuit protection, incorrect wire sizing, inadequate power supply, excessive demands and unsuitable connections from a shore outlet to the floating home's service. I shudder when I see standard outlets with multiple extensions. It is vital that you understand the safe capacity of your circuitry and never compromise it. Pay more if you have to, but get it done properly
- direct sewage discharge whether deliberate or due to the failure of improperly made connections
- uninsulated and unregulated pressurized fresh water supply
- inadequate railings and other necessary safety provisions
- ill conceived mooring arrangements; which fail to properly provide for rise and fall, plunging, yawing, wave action, currents and so on
- poor physical location, for example, undredged tidal shorelines or creeks, or the last spot at the end of the pier...
- compromised stability: FLOAT HOMES and most HOUSEBOATS, as opposed to LIVE-a-BOARDS rely on their "form" or shape for stability. Compromised stability due to excessive listing as a result of saturation, flooded buoyancy, top-heavy, inadequate buoyancy or poor design can be extremely dangerous.

This list is by no means complete, but I think you already know about these issues...

From here, let's move to subject of marine surveyors as they relate to floating homes. Marine surveyors tend to be broadly experienced in marine matters, particularly design, materials and construction. This means that they are hard to bamboozle. However, marine surveyors work according to instructions and the clearer and more detailed their instructions are the better the results. This applies particularly to the supervisory stage of new buildings.

For HOUSE BOATS and LIVE-a-BOARDS the Marine Surveyor can survey, audit, determine condition, compliance with relevant standards, and comment on whether or not one of these is an insurable risk, what it's value might be (usually in concert with market experts), and it's suitability for the scope of service required.

FLOAT HOMES are a different kettle of fish. Initially, the new FLOAT HOME receives its informal Certificate of Occupation (i.e., the CofO is not issued by a City or District, but by an architect,

engineer, constructor or other body acceptable to the financier and insurer), and financing, lending and insurance will be based on this. However, once afloat some FLOAT HOMES may continue to qualify indefinitely for insurers and lenders, but not always. Knowledgeable insurers insist on regular inspections of the underwater portions, perhaps at five year intervals, usually performed by a marine surveyor. Once sold or when a FLOAT HOME changes hands then the modern FLOAT HOME may well need two distinct kinds of service for a full and complete interaction with the list of interested parties: one for the "HOME" by a Home Inspector or (certified or licensed) Engineer, and one for the "FLOAT" by a Marine Surveyor or Marine Engineer. A FLOAT HOME owner who ignores the underwater portion of the home is placing his or herself in harm's way - regular self-inspections and simple maintenance are mandatory. So are regular professional inspections. Different jurisdictions may have special requirements. Check with your insurer and with your local government for guidance.

A The surveyor's primary function relates to three factors: suitability for the scope of service required, the condition of the item surveyed, compliance with applicable marine standards, and after these are assessed recommendations to bring the vessel into compliance and fix deficiencies will be made.

Why should you use a Surveyor from the AMSBC? The AMSBC members are subject to rigorous membership qualification assessment before they are accredited, members are required to comply with strict ethical and educational requirements, and may be subject to discipline in the event of complaints. The AMSBC has provided continuous service to its members, affiliates and clients since 1969, and we are in the process of amalgamating with the INTERNATIONAL INSTITUTE of MARINE SURVEYORS, an international organization with NGO status at the INTERNATIONAL MARITIME ORGANIZATION and a strong presence in the insurance and underwriting markets.