HOW I LEARNT TO BUILD

Introduction

The original inhabitants, the Tainos of Central America, named this island “Xamayca” meaning “Land of wood and water” and despite the damage and deforestation of the last five centuries, it is still an apt description of Jamaica which in its 4411 square miles has mountains and plains and many rivers. The climate is described as “Tropical Maritime” We have seasonal rainfall, tropical temperatures and relatively high humidity but good cooling breeze and trade winds. However we are in a hurricane and earthquake zone.

Jamaica shares a history with the other islands of the Caribbean in being fought over and by the European powers for centuries. These colonies made vast fortunes for Europe, mainly through the production of sugar, which was produced through a Plantation system dependent on the labour of enslaved Africans and the transatlantic slave trade. In the British Caribbean Islands the slave trade was abolished in 1807 and slavery in 1838. At emancipation most Africans left the plantation to settle in marginal lands, and the Establishment brought Indian and Chinese indentured labourers to try to maintain the plantation labour force. As a result the population of the Caribbean is very mixed with consequences for the Built environment. In Jamaica over 90% of the people are of African origin but there are many Asian, European and Middle Eastern migrants mixed in. The Taino did not survive the coming of the Europeans but their agricultural practices survive and their building traditions are relevant today.

Last year Jamaica celebrated 50 years of independence. Our population is just under three Million and the economy is based on tourism, agriculture and bauxite mining.

It hit me when I was invited to speak at this Commonwealth gathering that I am undeniably a commonwealth citizen. I arrived in Jamaica from London at age 2 when my father took a posting as one of her majesty’s overseas civil servants to work as a town planner following the destruction of Hurricane Charlie.

MY brother sister and I grew up during a very exciting period of Caribbean national development and self discovery, with parents who settled in a village in the hills above Kingston, eschewed “expat” society, travelled a lot to see the island, and were keenly interested in national development, social equality, nature and in making things.

I am also a daughter of the modern movement. I grew with notions of truth in materials, knowing that form should follow function, thumbing through books on the Bauhaus, and believing that architecture could play a role in transforming the world for the better.
I think it is this early interest in how things can be made, that has made architecture endlessly fascinating, and has given me a great respect for craftspeople and their skills.

So this paper looks at the influences on my architectural practice as I attempt to be sustainable and relevant in the Jamaican environment and culture.

The Vernacular

There could be no truer use of materials than in the structures of the Tainos whose buildings had thatch roofs which insulated and shaded, and porous walls of vertical poles through which light and air could pass. These houses operated on the same principle as hammocks, allowing air to circulate and keep the occupant cool.

The European settlers had other plans. They soon started importing and making bricks, cutting stone and burning lime to make mortar to build as they knew how. They learned through trial and error what gives a building “climate resilience” as we call it today.

Carpenters, masons, carvers and other artisans and architects came, from America, Europe, Africa and Asia, albeit under very different circumstances. They brought with them their idea of what a building should be and the methods and details of putting them together. As cultures of the four continents collided, some aspects of building traditions, of forms and features, were discarded, while others which suited the climate and the way of life were embraced and developed. Architectural styles imported and applied to Civic and Plantation Buildings were adapted for use in towns and country in buildings of different sizes. Ideas travelled between the island colonies in the Caribbean and up and down the North American coast. Through this complex process, a Caribbean Creole vernacular architecture was created.

The resulting buildings were almost of necessity sustainable. For the most part the materials were local-wood, stone, thatch and earth, suiting the climate and resistant in many ways to earthquake and hurricane. I believe we can learn from the principles that these early vernacular buildings embody, and offer some examples.

Natural Cooling

There are many examples of early buildings which use natural cooling techniques such as shading, cross ventilation and convection, to keep interiors cool during the hot cycles of the day and the year, taking advantage of prevailing winds.

Hurricane Resistance

Hurricanes impact the Caribbean and North America from June through November, often with devastating consequences. The geometry of roofs, reduction of exposed elements, use of ventilating elements to reduce pressure build up, and proper bracing and jointing methods has meant that many early vernacular buildings have survived season after season of hurricanes.
Earthquake Resistance

As we saw in 2010 in Haiti, our close neighbour, earthquakes can take a terrible toll on this region’s peoples and economies. There is evidence that before being completely destroyed by earthquake in 1692 the town of Port Royal was similar to the city of London before the fire, tall buildings cheek by jowl and of both masonry, and timber construction. In that same earthquake it was reported that the only buildings that survived in the inland capital Spanish Town, which the English had seized from the Spanish were those built of “Spanish Walling” which is nog construction- a timber frame in-filled with stone or brick in a lime and earth mortar, and rendered with lime mortar- a flexible structure.

Brick structures again suffered greatly in a major 1907 earthquake.

Reinforced concrete construction is now the norm in Jamaica, but the opportunities exist for other materials old and new to help us design in ways which are less dependent on imported material and fuel, examples of these are:

Lime

Once the only bonding agent used, lime is making as comeback as a green material. It is burnt at a lower temperature than cement, and re-absorbs carbon dioxide in setting. It can be used in cast walls, as mortar and in paints.

Bamboo

A “free” material used in temporary shelter, roadside stalls bamboo has great potential.

The Scientific Research Council is looking at the treatment and use of Jamaica’s bamboo resources as raw material for building products. This can be as a framework for masonry or in manufactured sheet products.

At Island Village Simon Velez built a stage roof and entry pavilion, bringing three Colombian artisans to teach local carpenters the jointing methods he has developed.

Thatch

Once freely available palm thatch is becoming scarce, mainly used in the tourism sector. I am advocating for it to be grown as a forest product for roofing screens and furniture.

Timber

I have tried to know the source of my timber, and use a lot of plantation grown pine, although it does not have the beauty of scarcer hardwoods. At the Cockpit country Information center, we used the forestry department’s thinning, treated with borates, to build railings and walkways.

Energy

Replacement of electricity generated through burning imported oil is also more and more imperative.

The energy used in buildings can be minimized through good passive design, and it is rapidly becoming viable for the remaining energy demand to be met through solar, wind and
geothermal generation. The Jamaican authorities are in the process of making grid tie possible, reducing the need for battery backup where the alternative power is generated.

**Water**

Rainwater harvesting and storage, and the use of water saving devices are all becoming a part of the vocabulary.

**Skills Transfer**

It is the Builder who, in the past and to some extent today, despite drawings and building permits, passes on the knowledge of how a building should be conceived and made. It is important that the knowledge that is passed on should include these principles of sustainable design. This has been important in the training and building projects that I have been involved with.

I have always had great respect for skilled craftsmen, in fact I am a little jealous of the skill to create with ones hands, which must be due to my early introduction to “do it yourself”.

I also know the power of tradition, clearly remembering a carpenter asking my father, “You want me to do it my way or your way?”

How have the traditions been relevant in the work I have been doing over the last 40 years?

MY interest in the building trades was further developed because of the fact that at the time that I arrived in Britain to study at the Architectural Association, architects were held in very low esteem by the general public. This in my view because the idealism of post war reconstruction through well designed industrialized buildings had been corrupted, and instead existing neighbourhoods of old familiar buildings were being razed to create large enough sites for system builders to prosper at the expense of community and urban design. Our AA Unit rejected the loss of skills these building systems engendered, and turned instead to restoration, traditional crafts, and self build as being more people-friendly approaches. With an interest in self building, I also found a model in the work of Walter Segal’s self built timber system which used timber in combination with modern sheet materials.

Returning to Jamaica, I went in search of vernacular buildings and their builders. With my good friend Dawn Scott who was a sculptor and fabric artist who later collaborated with me on building finishes, I set out to look for the buildings, and for the people who could explain or demonstrate building techniques. We noticed how the materials used, changed with the landscape, between limestone hills, coastal plains and wooded mountains.

We spoke to older country people and builders who could describe the processes for using lime and saw thatch work still being done.

My experience of traditional carpentry was more direct, as In 1989 I was commissioned to design a cottage for Island Records founder Chris Blackwell at Strawberry Hill, in the mountains above Kingston following the destruction of the original estate house by Hurricane Gilbert. I undertook to build as well as design. Priestley Leckie, known to the world as “Sleepy”, was master-builder for the cottage which included, at the clients request, many traditional features which had been elements of the original 18 century house.
The cottage being successful, we were retained to construct additional cottages, in the end creating a hotel of cottages around the slopes of the site of the former estate house nestled into a wooded landscape. They were somewhere between Walter Segal and Jamaican Traditional. They had a strict grid and kit of parts. Where they were in solid ground they were constructed of concrete to anchor them, but for the most part they stood lightly on the steep hillside with small concrete footings and tall braced timber frames. They were painted white and off white and the exterior woodwork was “sand-dashed” a treatment where sand is thrown onto the wet paint where it sticks, giving texture and protecting the paint from ultraviolet and possibly from termite penetration. Floors were coloured concrete on ground and suspended timber elsewhere, roofs were steep and shingled. Windows and doors were louvered for ventilation and privacy and glass for views and light. Roofs were steeply pitched hips for hurricane resistance. veranda roofs were kept separate and sacrificial although we have so far only sacrificed one. Strawberry Hill weathered hurricanes, and during construction in Jan 1993 an earthquake had carpenters clinging to a swaying half built cottage, but there was no damage.

The project generated a construction language that became so familiar that as the project progressed there were times where sections were built from the flimsiest of information because the workmen were familiar with the pattern of design.

Starting out with Sleepy and his small crew of mason and carpenters, the construction team was built up over time and we built a workshop which manufactured doors and windows. We ended up with a team of over 200 workers, the majority of them from the surrounding district and trained on the job.

Strawberry Hill complete Chris Blackwell moved on to another challenge, this time Goldeneye, the estate where Ian Flemming penned the James bond books which is on the north coast adjoining the small town of Oracabessa. Plans include the integration of the resort with the town, providing a waterfront and fishing beach on land purchased by Blackwell which had been reclaimed from the sea by the government many years ago and lay unused.

After a decade of planning, development of James Bond Beach, involvement in the community, and changes to development plans to accommodate the global financial crisis, phase one of the resort was completed in 2010.

The cottages are raised to allow the sea to pass below in a storm. It is in many ways similar to strawberry Hill, but more contemporary in detailing, and with more colour. Air conditioning is provided, but because the cottages are best lived in open and is well ventilated; guests get a discount for not using the AC. Driftwood- a free material, seasoned in salt water and therefore [so far] termite resistant, is used in fencing and screening, and in the bar decor. Bamboo was also used including complete with tops to give tall screening where needed.

Turning from high-end hotels, albeit hotels that relate to the communities in which they are located, to Inner City Kingston. The “CAA guide to designing for sustainability” is relevant, saying in part

“Current thinking is beginning to place the emphasis on social sustainability or well-being with economic prosperity and environmental stewardship as sub-sets. It is precisely for this reason that architects should engage themselves in the process
through the design process, for they are co-responsible for realizing social well-being in the built environment."

Rose Town is an inner-city area—a part of Trench Town, training ground of Bob Marley and many other musicians. There is a lot of life on the street, high unemployment, some small industry mixed in with housing, dilapidated and run down, yet the area is home to a vibrant and resilient community. There is a lot of open land because of destruction from political violence since 1970ies. In 1995, Mr Black with his neighbours started a movement to reunite and bring peace to Rose Town. The Rose Town Benevolent Society was formed to carry forward the development of the community with a first project funded by DfID to provide a bathroom facility and a shipping container building as community center.

Social Sustainability

The Princes Foundation for the Built Environment sponsored a design workshop for the community, and has set up a community development organization, the Rose Town Foundation for the Built Environment. I participated in the initial workshop becoming involved in Rose Town thereafter. Through this consultative process a Masterplan was drawn to rebuild a civic center including training facilities, work shop and industrial facilities, a park, market, shops and housing all on the now vacant no-man’s-land, reuniting North and South.

Housing proposals are being put forward based on the concept of retaining good buildings where possible and infilling within the existing lots and on the open land.

This is considered a better approach than the concrete 4 storey walk up housing blocks which cannot be afforded by the local residents and which provide no private or semiprivate yard or outdoor space for residents.

Within Rose Town the Community Organizations have prioritized water, Training/education and housing. A Project is about to get underway to provide a new water and sewer main and potable water with connections and community stand pipes along a repaved street running the length of the community.

So far there have been two construction training projects. A total of 28 youth from the area have undergone three weeks of residential training with another NGO, Falmouth Heritage Renewal, learning basic carpentry and masonry but also experiencing the use of lime and the hand tools used in carpentry. Returning to Rose town the first group continued training with a local trainer and in the process restored a small house adjoining the community center. The second group roofed and restored an old shop as offices for the Rose Town Foundation for the Built Environment.

With a now functional community, The RTFBE has just received a grant towards setting up a building materials workshop in Rose Town as an income generating project. Starting with a block-making machine, and with plans to establish a woodworking shop to make doors windows shutters etc. Other ideas include panelized buildings out of the wooden pallets that are currently freely available from the nearby warehouses.
A Functional Housing Model

In areas such as Rose Town, security and mutual support as well as economic necessity created a system which saw the “yard” as functional living arrangement which survives in many urban areas today. The climate allows for outdoor living, and the outdoor space can make up for restricted indoor space. The “yard” has developed as a functional living arrangement which survives in many urban areas today, providing collective security and mutual support with several households sharing the common outdoor living space.

The Hallin Bank Project was an opportunity to bring the functioning downtown ‘yard’ to an uptown site. Designed for a group of friends who pooled resources to achieve home ownership, the project sought to retain the 1940ies brick in-filled timber framed or “nog” house, keep all the mature trees, and create affordable units and livable communal space, all on a 1/2 acre lot near the new commercial center of New Kingston. Wide frontages, single room deep, two storey units were developed around a courtyard, within the shady courtyard the temperature can be several degrees cooler than the street, and the courtyard provides opportunity for social gatherings, shared meals, shared childcare and a degree of security.

Conclusion

In conclusion, “CAA guide to designing for sustainability” document summarizes the guiding principles I have found important when it says;

“The main challenges of sustainable construction which emerge are as follows:

- Promoting energy efficiency (energy saving measures; extensive retrofit programmes; transport aspects; use of renewable energies);
- Reducing consumption of high-quality drinking water (relying on rainwater/grey water; reducing domestic consumption with water management systems; waterless sanitation systems and use of drought resistant plants);
- Selecting materials based on environmental performance (use of renewable materials; reduction of the use of natural resources; recycling);
- Contributing to a sustainable urban development (efficient use of land; design for a long service life; the longevity of buildings through adaptability and flexibility; converting existing buildings; refurbishment; sustainable management of buildings; prevention of urban decline and reduction of sprawl; contribution to employment creation; cultural heritage preservation);
- Contribution to poverty alleviation; and
- Healthy and safe working environment.”