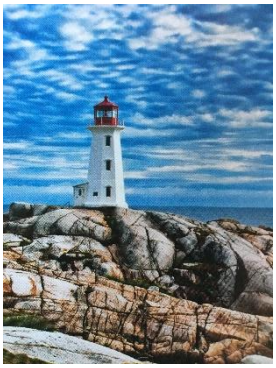
# The Trials of Building a Lighthouse

By: Jeff Marek

As a child in Haiti we would take walks through some old pirate and French ruins to a lighthouse. I had always thought it would be neat to live in a lighthouse. In 1983 I purchased a lot in Upper East Tennessee on a TVA lake nestled in the Appalachian Mountains.

I had mostly forgotten about my childhood dream and then during the design and building the house a General Electric salesperson delivered a calendar with Peggy's Point, Nova Scotia lighthouses on it. While drawing the original house plans, I made sure to leave space for a future full-sized lighthouse addition built up from the center of the house or attached to one side.

*Picolet Point, Haiti*



*On GE Calendar*

About 12 years after I designed and built the house, I was transferred to Singapore for almost 4 years. Singapore is a very small country, which after about 6 months one would have seen almost everything there is to see. So, to occupy my time I turned to building model sailing ships and adventure travel, which took me by many lighthouses. About six months before finishing my assignment I decided when I returned to the US, I should build that dream lighthouse. I had my son who was still in the States dig out my original house plans and mail them to me. I also had him take some strategic as built measurements and E–mail them to me.

With three model ships already built it was then easy to turn my attention to lighthouse design. It was determined that it would be 6 stories high, octagonal in shape and made of wood. The walls would be 6-inch studs sandwiched between plywood. The corners would be bolted together. I had chosen the side of the house as the best location option because it would be self-supporting. Building it up out of the center of the house would be much more difficult and a lot more disruptive to the inside of the house. The base would be 16 ft across octagonal sides and the walls would slope in 2.5 degrees. The lantern room would be 10 ft across sides and the complete structure would be 68 ft 2 in tall from the ground.

The weathervane at the top would be a copper model of the 4 masted schooner "Albert F. Paul" that my grandfather shipped logwood on from Haiti in the 1920's and 1930's. The walls would have (2) 3/8" cables in each corner running from the top to the foundation to hold the structure down in a gale. The floors were to be as follows:

1st - 16 ft across flats, Laundry room and greenhouse porch
2nd - Dining room and plant room
3rd - 14 ft across x 38 ft long adventure room
4th - Antique Bathroom
5th – Observation room - Bedroom
6th – Lantern room


*Suspended Stairs in adventure room*

The walls had to include electrical wires, TV cables, radio cables, telephone wires, and burglar alarm wires. The plumbing and heating and cooling duct could not be put in the walls because it would compromise the structural strength. A spiral staircase was ruled out because of space restrictions and the limitations it would put on getting things up and down inside the lighthouse. It was decided to suspend and stack the stairs with removable treads one above the other. The lantern room roof would be built with a hatch for construction and maintenance. The weathervane would be connected by a shaft to a wind directional arrow inside the lantern room. The lantern room should be wired with the capability of handling a minimum of 1000-watt light. A conservative back of the envelope wind load calculation determined the foundation needed to be about 4 ft wider than the lighthouse and require a minimum of 25 cu yds. of reinforced concrete. (The final amount was 27.5 cu yds.) The wooden structure made it necessary to install gutters and down spouts. Lightning protection incorporated into the weathervane would also be a good idea.

I moved back to the States in June of 1999. Since my house had not been lived in for 4 years it had to be partly remodeled. About the time this was done my thoughts again turned to building the lighthouse. Some checking made it obvious that to build it I would have to get a city building permit which would most likely need some kind of approval from my neighbors. To grease the skids my wife and I had a Christmas Party and invited all the neighbors. In the middle of the party I brought out the plans for lighthouse addition. It was obvious that my neighbors for the past 17 years knew I was an eccentric and picked unusual projects like underground sprinklers, floating boat house, fireproof storm room and grease pit in the garage but they never expected a lighthouse. Many asked why and my reply was I did not want bass fisherman to run aground. Their skepticism was even raised higher when I explained it was going to be 6 stories high. Everyone

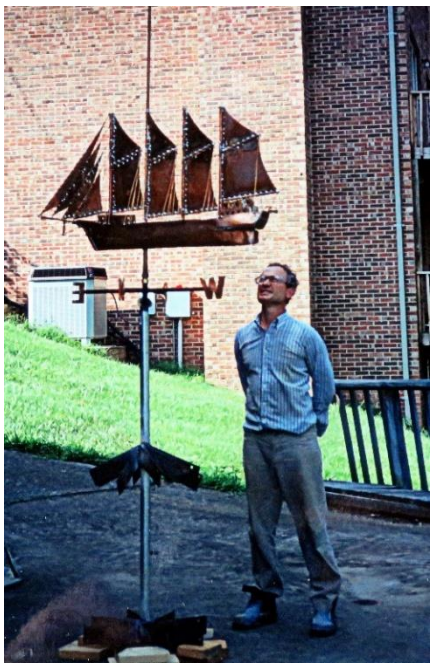
left the party sure that that Jeff Marek had even gotten more eccentric during the period spent overseas. Maybe even a little touched in the head.

At this point not much obvious could be done without a permit. I did however proceed to build trusses over the garage, 16' garage door and floored the attic where the third-floor adventure room would extend out over the existing house. The neighbors must have just assumed that Jeff was doing his thing again.

Ground was broken for the lighthouse in February of 2000. The foundation was all dug out with a pick and shovel and wheelbarrowed to another part of the yard. The concrete forms, reinforcing rod were put in place with the necessary lighting grounding rods, conduit, wall anchor points and drains. A time capsule was also filled and placed in the foundation. Eight silver dollars were strategically placed under the foundation for good Fung Shui. (A good luck trick learned from the Chinese while building a plant out in the ocean off Singapore.)

At this point I decided I probably should get a building permit since it would be difficult hiding a 68 ft high lighthouse. A set of plans was taken to the city building department and fees were paid. By this point I had figured that if I did not get a building permit, I would be the owner of an expensive concrete patio that would about hold up the world. Not to mention the neighbors thinking that old Jeff was even that much more eccentric, which I thought would be almost worth it. I returned to the Building Permit Department in about a week to hear all in one sentence "We have to deny your building permit because it is 1.5 stories to high; but we can probably get you a steeple waver from the exceptions committee." (It was clear they liked the idea.) This involved another fee, contacting the neighbors and a public hearing in about 6 weeks. The fee was promptly paid before they might have a change in mood. That night I made copies of the plans and distributed them to all the close neighbors and the ones across the cove who had all been watching me wheelbarrow dirt around the yard for about a month now. None of them seemed to have a problem with it but you never know what they are really thinking. The 6-week break allowed me to

*Foundation rebar*



*Weathervane*

shift my efforts to building the copper weathervane from old photographs and ship plans. After all, if the permit did not come through, I would be saddled with a copper weathervane to match the wooden model ships I had already built. A nameplate was even engraved and put on the stern of the weathervane.

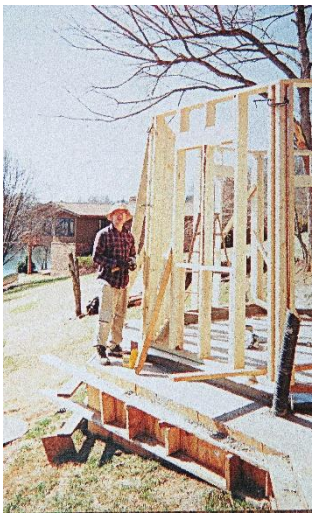
The City sent letters to each of the neighbors and the exceptions committee members all trooped out to inspect the site. It did not hurt a bit when one of the neighbor's friendly puppies got loose and wandered over during the inspection. I owe this neighbor big time because while retrieving the puppy he and his wife both explained that they thought it was a great idea. I had fortunately told the Building Department that I had already started to dig with a shovel because breaking ground before a permit is a big no, no. After all what could one guy do, in this day and age with a shovel and wheelbarrow. Then the night before the public hearing another neighbor came over with the plans in hand that I had given him and asked lots of questions. He also dropped that he was going to the hearing. There was no way to be sure what to expect from him.

My presentation at the hearing was done between the presentations for putting in a home for wayward men in a neighborhood and an oversized sign. With these on both sides how bad could a guy be who was wanting to build a lighthouse? As my presentation was being made the committee members poured over the drawings. I was very nervous until the questions started. "What kind of stairs are you going to put in it? Are you going to candy stripe it?" There was none of the "If we let you build it." Then they asked if I was going to put in a flashing light and foghorn. At that point I caught my neighbor wincing and I said I thought about it and if I did, I could sound the foghorn in the middle of the night to keep the bass fisherman from running into the rocks and wake my neighbors up. Not only that when they came to check it out, I could shine the light in their eyes. I could even spotlight them like a deer. Fortunately, everyone in the room cracked up including my neighbor. Then the committee chairman asked if anyone in the room wished to say anything and my neighbor stood up. I thought "Oh boy this project is dead now." My neighbor then proceeded to explain that "this guy has been my neighbor for 17 years and he needs to build it to the full height." The LIGHTHOUSE was then approved with two stipulations; "A foghorn and signal light would not be permitted."

At this point the frequency of wheelbarrows moving dirt picked up. Fortunately, the weathervane was completed by this time. A fisherman asked me what I was doing as he cast a fishing lour along the edge of my boathouse. When I explained I was digging a foundation for a lighthouse it was obvious he was a skeptic. It did not keep him from his explanation that he poured concrete for a living and would give me an estimate. I said sure and a bargain was struck. He would supply labor to place the concrete and finish it and I would pay for the concrete and the concrete pump and everything else. Concrete pouring day finally came, and I left work at 10:00am to check on progress. Much to my horror

*Foundation & a Sidewalk Superintendent*

I found they did not know anything about concrete pumps and had already plugged it up twice. I soon found that I was the job foreman and God forbid knew more about concrete pumps than even the operator that came with the pump. To make a long job short 27.5 cu yds of concrete was placed and finished by 10:00 PM.



*Framing First Floor*

After a week of curing the foundation, framing of the first floor started. In order to maintain my reputation, I had decided to build as much as possible by myself. In fact, it became almost an obsession after the episode with the concrete. It was soon discovered that a wedge jig made at 2.5 deg depicting the slope of the sides was necessary so a carpenter's level could be used to square up the walls. Also, a reference center pin for the octagonal shape installed in the concrete was repeated on each successive floor with a brass pin. Many of the angles had to be cut with a hand saw because the angles were greater than the 45 deg maximum a power saw can cut. All floor joists radiated from the center and steel suspension bars had to be cut into the joists and installed. Water filled clear tubing was used to assure that the floors were even with the existing attic and house's adjoining floors. By the third story of framing my 30 Ft ladder suddenly became too short. To frame the 4th story a 40 Ft ladder had to be purchased. When the 4th story was raised the job was suddenly overwhelming and it became obvious that my investment in the 40Ft ladder would be useless on the successive stories. Sidewalk superintendents of neighbors, boaters and drivers from all over would stop and gawk. Only the immediate neighbors had a clue as to what was being built. Needless to say, there was a lot of interesting speculation.

*4th Story*

By this time the lighthouse was taking an average of 32 hours a week of after work time, weekends and holidays. A common question was why would you take on such a project? My answer was that it was my substitute for a gym. Even though it defies the laws of physics it is amazing how much heavier a 2x6 gets by the time it reaches the 4th floor much less the 6th. My wife must have sensed my frustration, so she suggested an

adventure to Russia and at the same time my full time 60hr/wk. job decided I needed a project in the Czech Republic. These adventures provided needed down time and think time. I started to get nervous about weight and forces that the lower floors would bear. This caused me to double up the 2x6's and add fire stops on the lower 3 stories. Also, as the structure got higher it seemed like there was some sway. Anyone that has experienced high work can appreciate how 1/2in sway seems like 1/2ft. This caused me to add inside braces on each floor at each wall. I can safely say that upon completion there is no sway. Climbing over the sides to nail up siding on the 4th level was quite a sensation. I devised a 3ft long handled hammer and a nail holder to overcome climbing over the sides. At least learning how to aim and hit the nails with these contraptions helped protect my already black and blue hammer-hit thumb.

*Braces*

Injuries should have been expected. I never did put a nail completely through my hand but did experience major carpel tunnel, sunburn, dehydration, and knee sprain symptoms. There was no stopping at this point. It was amazing how the more you keep at it the more the symptoms seemed to go away. A few boards got dropped which did not come to rest until they punched through a couple of sub floors and shattered. This was one more reason to have no help around.

*Weathervane in place*

The most difficult job was installing the weathervane on top of the lantern room roof. After numerus hair-raising tries a 15ft extension ladder used as a jin pole ended up doing the trick. It took 8 hours of work just to place the weathervane. Securing down the roof was no easy task either. A person deserves to get nervous when his body from the waist down hangs out into the middle of nowhere even if he is tied off. A support jig had to be built that attached to the weathervane bracket so I could climb out over the edge to screw in the lower roof fasteners, A makeshift sky climbing scaffold had to be made to finish up the outside trim work. A safety harness and safety belt with 2 lanyards became the uniform of the day.

*Sky Climber*

At this point the complete structure was without windows and topped out at 68ft-2in (including a green bow fastened to the base of the weathervane for good luck

*Ladder going up stair opening*

and to thank the trees for their wood. It was now under roof and time for a building inspection. It was rejected. I found out the inspector was afraid of heights and did not like climbing through the empty stair spaces. An explanation that the stairs were the last things to be built because everything had to be block and tackled up through the hole for the stairs convinced him to pass it.

I thought at this point that I would try to contract out part of the remaining work. I thought it would sure be nice to have someone else put in the windows. The bids came in 10 times higher than I could do it for. This further reinforced my obsession with doing it all myself. The only help I had with the windows was a brave neighbor (same one that came to the exceptions hearing) who steadied the lantern room windows as they were nailed in. The insulation and sheetrock were done by others at a premium cost. The sheet rocker was going to walk out on the half complete job unless the already exorbitant price on which we had agreed was doubled. Even with the increased amount he complained continuously about all the angles that were explained when he bid the job. I did have to redo a lot when he finished the job. The only thing I can say is I did not get itchy putting in insulation or dusty finishing most of the sheetrock. The bidders saw dollar signs on every job I attempted to contract out. In each case it was 4 to 10 times higher than what I could do it for. Typical construction at the time would be double what I could do it for. The building supply company lady was fantastic in getting me fair prices and unusual building materials. Then there were some suppliers that would ask what I was going to use the unusual supplies for such as the 10in round stainless-steel float for the weathervane ball. Every lighthouse must have a ball on top. It was clear that the explanation that they were for a lighthouse was met with the thought “oh sure.” The ones that did believe it pictured a 4 or 5ft yard ornament.

Two years and two months after breaking ground the lighthouse was complete and ready for the lantern room light. During the 2 years and various trips all over the world I could not find an affordable lens. Even the infamous Internet of the time came up empty. I then remembered a lab glass company a few miles down the road. I walked in their office armed with a small 4in high copy of a sort of Fresnel lens that Lowes sells to cover bulbs on some cheap fixtures. I asked if they could make me something that looked sort of like it only 5 times bigger. The reply was they would have to think about it. I was called the next day to let me know they would have to order the glass from Germany. After explaining that their price was more than my budget could afford, he asked me what it was for. He got excited when I explained that it was for a lighthouse. The next day I got an urgent call from him saying I needed to come by on my lunch hour. When I got there, he took me into the production area and showed me some scrap

cylindrical Pyrex glass that he could fuse and combine at basically the cost of labor. I ended up with an exceptional looking lens that could not be construed to be a signal light but looked awesome. After 4 weeks of welding, wiring and turning on a wood lathe I ended up with a light that looks outstanding on a base that turns.

Furnishing the lighthouse was also a challenge. Early on I decided I would try to limit the furnishings to things I acquired on my various adventures around the world. It was soon obvious that the Observation Room's bed box springs, 4th floor's clawfoot tub and adventure room sofa would not go up the stairs. Unbolting the suspended stair treads and the old familiar block and tackle solved the problem. The full-sized lighthouse addition now stands basically complete except for a Roman type mosaic map of the world on the 1st floor. After hammering almost, a ton of nails it seems to be worth the effort except that now I need to go to a gym. Also, since it went in full service on May 25, 2002 no bass boats have run aground. If I could have contracted its construction out it would have cost 10 times as much. After I told my wife I would not sell the house for $3,000,000 she said I was sounding like one of the contractors.

Completed Baie de Caracol Lighthouse

By: Jeff Marek 6/24/2019


4039

*Adventure Room 3rd Floor*

*Bathroom 4th Floor*

*Observation Room/Bedroom 5th Floor*

*Lantern Room 6th Floor*

*Goodbye From The Top*


BAIE de CARACOL
LIGHTHOUSE
DESIGNED & BUILT BY: JEFF MAREK
COMPLETED MAY 25, 2002
TOPPED OUT - SEPTEMBER 23, 2000
GROUND BREAKING - FEBRUARY, 2000
TOTAL HEIGHT - 68 FT 2 IN
ROOF HEIGHT - 61 FT 2 IN
LANTERN ROOM - 50 FT HIGH & 10 FT WIDE
BASE - 16FT WIDE
FOUNDATION - 27.5 CUBIC YARDS, CONCRETE
NAILS AND FASTENERS - 1 TON
OCTAGONAL SHAPE WITH 2.5 DEG SLOPED WALLS
LABOR - OVER 4,000 HOURS, MOSTLY ONE PERSON
CORNER ANCHORS - (2) 3/8 IN STEEL CABLES/CORNER
WEATHERVANE - 4 MASTED, SCHOONER: ALBERT F. PAUL
LAUNCHED - AUGUST 2, 1917
TORPEDOED - MARCH 13, 1942