The Barn of Fun Primer

Duo Dickinson

In 1997 I asked my eight-year-old if he would like to have a "Fun Barn" built to the side of our house and he responded "No, Dad, I do not want a Fun Barn, I want a Barn of Fun." Here's the "deep background" on our multi-year endeavor, involving at least 26 species of wood.

A. The Setting

This site is relatively unique – an undeveloped glacial morain landscape. Perhaps used 60 – 70 years ago for a sheep pasture that allowed startlingly large white oaks to grow amid the boulders on the north-facing slope bounded by a 5 acre tidal wetland.

Additionally, our site had a cluster of 100-year-old blueberry "bushes" (actually small trees) and a wide variety of native plants that are augmented by some Asian ferns. A full "wetlands remediation" planting has occurred post construction using indigenous native plantings.

B. History

When we built our home in Madison, CT. in 1983 and added on in 1989, we fully expected that our 1.2-acre parcel was "it". We are hard by our front yard setback to the south, the wetlands setback to a five-acre salt marsh to the north, immovable septic system and view easement to the west, and a 200-year-old oak tree to the east. Then along came a client in 1995 looking for a piece of land in Madison. I had heard that the Boy Scouts were thinking of selling a 3+ acre parcel on our eastern boundary and when I connected those people to the Scouts, they quickly purchased it. I then offered them a simple deal – give me as much land as I would need to create the septic field for an outbuilding to the east of the oak tree and I would accept the land as my fee for designing a home for them on the remaining site. After a fair amount of engineering work, it was determined that approximately 2/3 acre would be required to build a septic system to support a fairly substantial outbuilding and its septic field.

The site was carefully cleared under the guidance of Bob Kuchta a local land use consultant and the town's Wetlands Officer, in 1999, preserving the blueberry bushes and other native specimen plants. We ultimately located the barn so that it clears three large rocks at the north and east walls and the underside of the floor. This boulder-determined level also just cleared the height limit for the bottom of the floor structure as determined by Federal flood codes.

The septic field and lines (involving a pumped system) and utility lines connected to the house's mains and meters, and "basement" were roughed-in in 2001.

Once a preliminary design was created, I wrote ten post-and-beam companies I thought might be interesting to work with. One jumped at the chance, Bensonwood out of New Hampshire. The guru of Bensonwood is Tedd Benson, who has written for Taunton Press, including The Timber-Frame Home, I knew they would be fairly savvy when it comes to thinking in fresh new ways about building innovatively on a budget.

I proposed that Bensonwood could keep costs down in 4 ways:

1) Using any and all "leftovers" from other frames
2) Using any wood they wanted (ending up at about a dozen species ranging from newly cut fir to recycled 19 ft. center white oak barn beam and Northeast white pine timbers from a manufacturing plant in Danbury.
3) They could have any time frame they needed
4.) Using any detailing they wished..

I was pretty sure that it would get published so their good ideas would have exposure. I asked for a price break based on these aspects and Bensonwood agreed, and their head engineer Ben Brungraber led the charge.

With an agreement with Benson Woodworks in hand we executed the concrete pier work in February of 2002, the stick built first floor deck in March of 2002 and had a full barn raising in the last week of April of that year and clad the entire surface of the barn a month later. The finish work (interior and exterior) took the next 2 years.

C. Limits

This project evidences several interesting code compliance issues.

1. The local zoning codes did not limit accessory building design very much. We can have a kitchen, a bathroom, and our own septic system. In other towns, the caveat to research before you jump in would have real meaning for people considering building secondary buildings.

2. This is more or less determined to be a coastal site determined to be on coastal/tidal inland-wetlands. It is legal for us to be fully within the Buffer Zone if we used a sonotube foundation where we were in the buffer. Given the zoning setbacks from our lot perimeter and the setback to the wetlands, we were thus allowed a 6 ft. x 8 ft. actual "basement" for utility connection. As noted we are in a tidal inland wetland condition and thus have a height restriction for the construction of the first floor level of the building, we had to maintain a height of 14 ft. above mean high tide to the bottom of whatever structure we are using (just clearing the aforementioned rock).

3. The septic system we installed is fed by a macerating pump as the one code-complying area we could find in the adjacent land for septic disposal is fully 10 ft. higher than the house itself.

4. We had to carefully create a silt fence limit to the construction area – twice. First time was a disaster with a clueless crew ramming the silt fence through the wetlands along our property line – necessitating the full remediation planting using native species laid out by a consultant.

5. We had to hold back one part of the 4' eave overhang at the porch to 1' to prevent overhanging the actual wetlands line – (it responds to the entry, so it looks intentional vs. reactionary)

In these ways, this project is fully representative of the classic limitations present for coastal or near coastal sites all across America whether the buildings face salt-water or whether they are on lakes, rivers and wetlands that are increasingly viewed as being ecologically fragile.

D. The Design Program

1. We have 2 sons. It was important that when the older boy was becoming a teenager they have their own rooms and thus their relatively large shared bedroom was kept by the older boy and our lone guest bedroom and bath was given over to our younger son. Thus, any guests now stay at the Barn of Fun.

2. Because our existing house was literally micro-managed into an 1800 sq. ft. total size, we had no ability to have a screen porch (a nice idea when you live on a tidal marsh). Although our existing home's rear porch is a wonderful and lofty place to dine al fresco, because of the structural limitation imposed by our reduced footprint, it is only 6 ft. wide x 20 ft. long and, although the bugs do not bite us because we are fully 25 ft. above the ground below, we also have a fairly obvious disconnect with the landscape. Our fantasy was to have a porch large enough to have a sit-down dinner for twenty or thirty people. Thus part of the design is a 350 sq. ft. screen porch. Dinners need kitchens so that became part of our program.

3. Beyond the screen porch area and the guest room, there is a space for a small gymnasium (for myself and my younger son who plans to lift weights).

4. Since we have no real basement and precious little attic for storage in our house we needed some space for storage as well.

5. The tales of teenagers getting into real trouble at distant parties, and/or traveling to and from those distant parties, have led us to believe it is best to have the parties at our house. Thus a space that is not under our direct supervision, that is fun and rugged enough to accommodate the usual teenage predilections for music

and behavior that parents hate makes sense. This means games, TV, and a piano. Oxymoronically enough, we hope to keep our children closer by casting them out of the walls of their home.

6. We wanted a space suitable for organizational meetings for charitable fundraising – I am on the local Habitat Board, raise funds for the library, and founded the local arts associations, and civic groups which meet in our home regularly.

7. Our boys both sing and play piano; one plays the cello, the other the French horn – so a place to practice away from the home was a good idea.

E. Interior

Not unlike our collaboration with Bensonwood, the interior was a fruitful collaboration between myself and another truly gifted craftsman - Tim Mills. He had contacted me through his wife, a graduate student at Yale who was simply looking around for architectural offices that might be interesting to work for. Tim showed me his portfolio of his design / woodwork projects; it was. filled with things that were halfway between shop-fabricated product and built-in-the-field product – a perfect skill set for this endeavor. As with Bensonwood, I implored Tim to give me his best value based on the fact that I had virtually no deadline and would supply any and all materials he needed directly. I also noted to him that my input would be holistic in nature (meaning I would leave the detailing completely to him) but noted that there were several elements that were fixed in their location and dimensions. Based on these limitations Tim came up with exceptional design solutions. The areas Tim were:

1. The entry closet.
2. The stairs (see Cost Saving Measures)
3. The curving bedroom wall/bookcase upstairs
4. The storage closets upstairs
5. The bathroom door (totally his concept and design)
6. The double doors going into the mechanical room – (they utilize virtually a scrap from each material used in the project – from leftover stair bits from the original house stair that was recycled, to porch decking, to leftover bits of the indigenous oak floor, to the cutoffs from salvaged plywood pieces used to make doors, to the very last bits of leftover flooring – a virtual quilt of elements - the salvage from recycled materials, perhaps Green^2).

The kitchen was my design and built by Atlantic Millwork using about 12 different woods to frame pre-laminated cabinet fronts – including a teak pull integrated into the front. The counter tops are discussed below.

F. Building on a Budget

Beyond using Bensonwood to provide the frame and skin of the house at reduced cost, we've garnered a host of recycled or bartered items. These include:

1. 350 sq. ft. of white oak flooring harvested from a large tree that had to be felled to accommodate the Barn of Fun. Two large logs were resawn on site by a portable saw mill and will be stickered under our house for approximately 2 - 2½ years to become dry enough to lay down as flooring.

2. The roof is one of the more interesting aspects of this house when confronted with a $20,000 cost for a standing seam aluminum roofing (even with re-using a bunch of "leftovers" from a job), I worked with Precision Restoration to use the cheapest roofing available (rolled asphalt – mostly used for factory buildings) and oriented vertically (versus normal horizontal application) and used dark green aluminum standing seams as the joint between those strips (versus lapping). Miraculously enough the roll ending up being 6" longer than the longest available run of this asphalt (at the entry roof extension) allowing for no horizontal seams. Additionally the perimeter of the eaves is clad in the same aluminum this cost 1/2 of the standing seam roof.

3. A "pieces and parts" stair of teak "scantlings" (small pieces of teak left over from boat building) together with the cedar stringers and redwood newel that were part of the stair that was previously in our original house (pre-1989 addition), which we disassembled and stored under the our house just for this recycling.

4. Two clear silver birch columns that were rejected from a project of mine for being "too fat".

5. A five-year-old hot water furnace that had to be taken out of a house we added on to because the total new area of the house required a new heating plant. I was able to take the cost of the heating plant "in trade" for my design services. Our plumber had the brilliant idea of utilizing this furnace as the heat generator for water that would then be set to a blower unit which would then distribute the heated air both upstairs and down (creating minimum disruption of the existing frame and SIPS panels.) When combined with two factory "seconds" fans from Woolen Mill the one zone open space is easy to keep warm with relatively even heat.

6. Two large stones from the oldest building site in Madison – their cost was credited against my design fee for another project. (These were probably split off as part of a local quarry perhaps 150 years ago and have been stacked on that site unused since then.)

7. Our old kitchen appliances were recycled from our house.

8. The kitchen counter uses remnant stone pieces next to the stove, leftover Avonite from our shower as backsplash material, stock butcher block tops for prep areas and stock post formed laminate (no seams!) at the sink.

9. 1 1/2" T&G flooring was provided by Wood, Steel and Glas of Madison (and its one-of-a-kind owner Wil Armster), who specialize in using recycled or salvaged wood. There are at least nine varieties of wood in the floor (some are redundant to the house itself). Additionally, we were able to get "specialty" left-over pieces for the "bridge" that spans over the entry. These include strips of redwood salvaged from an 1880's trestle bridge from California, bizarre off cuts of maple, cypress, tulip wood, mahogany, and others.

   When calculating the square footage for the flooring, the initial amount was undercounted and Wil delivered way more than we needed to finish the floor so we used the leftovers in a variety of places (see below). All flooring was pre-sealed by me – (also pre-finishing the first floor ceiling).

10. The following items where made from leftover salvaged wood provided by Wood, Steel and Glas (if that is not a redundancy):

    a. Siding is clear cypress directly imported from the deep south (no distributor) and uses the unfinished smooth face of random width boards, while the 3" battens have their rough face out coated by me with Cabot's bleaching oil. All fasteners are stainless steel, so this is close to a zero maintenance skin

    b. The entry closet doors (we used leftover cypress siding for its walls).

    c. The curving wall that separates the sleeping space upstairs from the rest of the second floor. We originally felt that it might be nice to have its top cut to a curve, but the creator of that wall, Tim Mills, had used pieces that were exactly the right length to form the descending height we wanted and when he drew the curve along the wall we decided to keep it stepping (at least for now). The backside of this wall is painted for contrast.

    d. The Door – leading into the bathroom.

    e. The doors that separate the mechanical room from the bathroom (the salvaged wood in these areas also includes leftover pieces of decking, siding, the hardwood flooring platform underneath the main stair, and anything else we could find.)

    f. The doors for our large-scale closet storage area were created with this wood as well, but also used leftover pieces of 6 different veneer-faced plywood salvaged from three different wood working shops throughout Connecticut.

11. We used Bensenwood's stress skin SIPS wall system, but saved costs by simply priming the oriented stained board inner face – giving it a single finish coat once installed – and avoiding using any sheetrock.

12. Rather than try to hide our electrical work we decided to fully utilize conduiting to provide for maximum flexibility – simple keyless lighting is supplied now but over the years any number of different fixtures, fans, etc. will be installed.

13. Unused leftover siding was used for flooring (and for all trim!).

14. We found remnant rubber flooring on the web for the kitchen.

15. Woolen Mill fans were used upstairs – they were "seconds" and half-price.

16. Eagle windows sold me rejected/mistake windows at a great cost reduction.

17. A client worked off his bill by using his backhoe for gravel and grading work.

18. My office neighbor is the local Avonite representative and in exchange for drawings of his house he fabricated our shower interior using Avonite purchased at a discounted price, and used leftovers from the shower for the kitchen backsplash.

19. I pre-finished all wood elements of the kitchen.

20. Fixed polycarbonate sheets used as skylights over the screen porch are super cheap compared to their glass counterparts.

21. We extended the house's mechanical systems (water, gas, and electric) saving about $10K over setting up new lines.

G. Sexy Engineering

Despite the tight budget, Bensonwood and my own thoughts about how to build this house resulted in some very interesting engineering solutions.

1. First, the platform for the building involves a very large cantilevered floor for the screened porch deck. The cantilevers are set off of a simple concrete sonotube pier system utilizing pressure-treated parallam beams with standard 2x stock spanning in between them (we could not drop beams due to the height limitations imposed on us by the adjacency to the tidal wetlands.)

2. The 3-D truss inside the 2½-story screen porch space imitates tree forms. Since we have no use for this space other than to offer a completely uninterrupted view out over the 5-acre salt marsh, there was a lot a freedom to provide enough structural mass to resist the wind loading involved. Bensonwood used Engleman Spruce for the first time for some of the members.

3. Bensonwood often has trouble trying to figure out how to suggest visually attractive collar ties to their clients (horizontal members held in tension that tie together the two sides of a gable roof). In this case, it is particularly appealing because we have unequal legs to our gable roof (one side of the rafters is shorter than the other side and one side has a lower plate than the others, thus traditional forms of connecting the walls cannot be done easily.) They asked "Do you mind if the columns are not plumb?" "Go for it!" was the reply…and "trees" grew upstairs.

4. Additionally, there are a wide variety of joinery techniques and detailing which Bensonwood has displayed here which had yet to be built in a photogenic context and thus presentable to potential purchasers of their product.