

Construction – TS Beard Architecture of Ipswich, MA. Scanlon Contracting  
Photography – Jon King

### Energy Efficient Remodel

Often we're writing about projects that include a client, architect and contractor. In this Project Spotlight the architect is also the client. What a fascinating opportunity to see how an architect designs in 2015 to suit his priorities when he isn't attending to the desires of a client.

Tom Beard is a seasoned architect who is the proprietor of TS Beard Architecture of Ipswich, MA. Tom primarily designs residential architecture with much of his work concentrated on Cape Cod and the Islands. We had a chance to photograph Tom's new property and learn more how his new completely renovated home became a reality.

*Tom, would you tell about how your beautiful new home came to be?*

Our new home is actually a renovation of a ranch house that had been built in 1969. It was in very poor shape when we purchased the property having been unoccupied for ten years. We were looking for, and found this property, a house on a nice site with no historic fabric that we would feel compelled to respect (my wife is a historic preservation consultant). My wife and I were relocating from a house that had a walk-up attic, a large basement and a garage. This house had none of these when we purchased it. We enjoy outdoor sports (mountain biking, paddling, skiing, etc.), as well as yard work, woodworking, arts and crafts. I designed a garage to help contain these activities as well as keeping the cars protected and more importantly, out of sight.

The lot is large but narrow. The existing house was well positioned to take advantage of the view of the Indian Hill Reservoir but the approach to the house from the street was awkward. I used the position of the garage and the existing (as yet un-renovated studio) to create a courtyard to focus the entry sequence. The design of the garage is indeed jogged to respect the zoning setbacks. With the exception of a small addition which houses the master bathroom we retained the perimeter of the existing structure. But while the foundation and roofline were re-used most everything else was redesigned.

*Being an architect and knowing what you wanted, it must have been almost fun to take on the design challenge?*

We had several goals: Contemporary living after renovating and living in several historic homes, we desired spaces for entertaining and outdoor living. I wanted to design for one floor living in anticipation of aging. Downsizing after our daughters had gone away to college and beyond, but providing space for them to return. The lower level opens to grade and a fantastic water view. This level contains two bedrooms, a large common area and a bathroom.

Energy efficiency was another primary goal and each element of the structure, from the slab to the roof was treated to maximize insulation and air sealing in the most cost effective manner. The un-insulated slab was covered with rigid insulation with the finished floor "floating" above. The foundation walls are insulated with closed cell spray foam which provides both insulation and waterproofing.

The 2x4 exterior walls are covered with closed cell spray foam on the exterior (the

siding is attached 2x3 cleats isolated from the sheathing on 2" XPS spacers to prevent thermal bridging) and insulated on the interior with high density fiberglass batts. The roof has 4" of rigid insulation above the sheathing and the rafter bays are filled with high density fiberglass.

The house is enveloped in an exterior blanket of closed cell spray foam which serves as both insulation and air sealing. This technique required some creativity when it came to the detailing of the siding, windows, decks, etc. Fortunately, Sean Scanlon, my contractor and friend, enthusiastically helped to work through these details.

The broad overhangs were a feature of the existing house that we definitely wanted to retain both because of the aesthetic (the broad sheltering roof) and because they serve to protect the siding and windows from sun and rain. The Western Red Cedar siding was very important both because it is consistent with the design aesthetic and because it helps to integrate the house with the landscape. The warmth of the natural wood helps to soften the modern lines which might otherwise feel too cold.

We chose to use copper gutters and downspouts, despite the cost, because of their durability and appearance. We regret now, not having installed a rainwater collection system. Our goal at the time was to get the water away from the house so that the lower level finished spaces were not at risk, but given the recent dry spell a collection system would have been very beneficial.

Because we wanted to take advantage of the view the design included many windows. In order to meet my energy efficiency goals I decided to use triple pane units. I chose Marvin custom clad units for their beauty, durability, design flexibility and performance.

*Has the house functioned and performed to meet your standards for energy efficiency?*

While we have spent only one winter in the house so far, it was a pretty extreme test! We used about 250 gallons of propane for heating, domestic hot water and cooking combined. It is very easy to heat the house and the air sealing measures (mostly the spray foam) make it very tight (1.1 air changes per hour); there are no drafty spots. The heating system is propane fired high efficiency boiler (Viessmann) supplying panel radiators. The domestic hot water is an on-demand system also supplied by the boiler. The cooling is supplied by a centrally located Mitsubishi mini-split.

After learning from Tom Beard the architect and owner we spoke with Sean Scanlon the General Contractor about his company and experience with this Tom's project.

*Sean, can you tell us about your company and how you got involved with the Beard Project?*

Our company, Scanlon Contracting has been in business for over twenty years. We consider ourselves a small residential company. We have our own in house carpenters, job supervisors and project managers. We focus on high end architecturally designed homes and remodeling work. We seem to work almost exclusively on the North Shore of Massachusetts. I have known Tom Beard for quite some time and I was delighted when he asked if we could work on creating a new home out of a well-used ranch.

*Besides working with Tom, what was attracting and challenging about this project?*

Tom was looking for an uncomplicated look with clean modern lines. Additionally, he was looking to convert the house to be super energy efficient. There are no standard strategies to build a super insulated house. The existing house was in pretty tough condition so after gutting it, we had a blank slate to work with. Additionally Tom had plans to add a small addition to the house, a large deck and a separate garage/barn structure.

I welcomed the challenge. Our project incorporates the science of negating thermal bridging. We incorporated insulation techniques outside the building envelope. A rain screen was achieved using the strips applied over rigid insulation. When the house was finished it achieved extremely positive results from blower door testing.

*We understand you worked with Bert Raymond from Selectwood in specifying and supplying materials for Tom's makeover?*

Bert was a great resource in specifying and supplying materials. The house makes extensive use of Clear Vertical Grain Edge Matched Tongue and Groove Western Red Cedar on the exterior siding and trim. We made use of Clear Vertical Grain Douglas Fir for the interior including most of the ceilings. Selectwood specializes in both these materials and was able to source the level of consistent quality we required. It certainly makes the house a showpiece. Bert also supplied the Douglas Fir interior doors, railings and trim all made from Clear Douglas Fir. In addition to the exterior siding Bert supplied the Meranti decking and a Cable Rail system integrated with Meranti posts.

I may be bias but the pictures bear out the quality of the house. It proves a super insulated house can function as designed and still be spectacular in appearance. Thank you, Sean and Tom for all your input. The finished house leads us towards the future of energy efficiency and the size of modern home building.