LIVING IN HARMONY WITH NATURE

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INTRODUCTION

Mount Desert Island is one of the most beautiful places in New England. Situated in the middle of Penobscot Bay in Maine, which is home to Acadia National Park, one of the most visited parks in the National Park system. The landscape is classic Maine, with evergreen trees clinging to a rocky coastline. Over the past 150 years it has been a summer retreat for many, including the Rockefellers who helped create the carriage trails in the Park, and home to the infamous "cottages" of the wealthy that came to the Island starting in the second half of the nineteenth century to escape the hot summer temperatures of the cities. It was on this island, in this historic setting, that Pondicherry was created. With a love of this unique place and a desire to find a way to live here in harmony with the natural setting, the owners sought out Scott Simons Architects to help them design a unique house, one that would combine aesthetic beauty and ultra high environmental performance.

They were looking to create a new way of living on Mount Desert Island. They appreciated the natural beauty of the Island and loved to hike in Acadia National Park. They wanted to design a house that was in harmony with the Park surroundings vs. the large cottages of Northeast Harbor where their family had vacationed for over a century. After years of searching they found and purchased a piece of property on a glacial pond along the edge of the Park boundary. They imagined a house that would respect the natural setting and features of the site, and used phrases like "simple, clean lines", "human scale", "lots of natural light", "all natural materials", and "timeless quality" to describe what they were looking for. Their initial goal was to have a high performance house that did not consume a lot of energy. The husband was on the board of a national environmental organization, and he managed the family forestry business in northern Maine. He was in contact with a lot of people who were talking about how to preserve the environment and wanted his house to reflect that commitment. During our initial meetings about the design of the house we discussed different approaches to not only the layout and look of the house, but also what we could do to reduce its carbon footprint. As the design of the project developed, we realized we could achieve much higher sustainability goals than originally imagined. The idea of a beautifully designed home, thoughtfully sited on a beautiful piece of land on Mount Desert Island, that could also generate all its own electricity and hot water, emerged as our new goal. We set out to integrate the best of design with the best of energy performance. We raised our targets to Net-Zero Energy and LEED Platinum certification, and began

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developing the energy and daylight models to test the performance of the schematic design concept. When the design of the house was nearly complete, they told us they were going to name their new house Pondicherry, which means “new settlement”.

KEYWORDS
Net-zero energy house, LEED Platinum, natural setting, net-positive energy.

FIGURE 1: Maine coastline on Mount Desert Island.

FIGURE 2: South façade at twilight, with floating wood deck, screen porch, and cantilevered roof at master bedroom.

SITE CHARACTERISTICS

The property includes four acres of land on the northwest corner of one of the smaller glacial ponds on Mount Desert Island. It was previously undeveloped and had only deer tracks as markers of any activity on the site. Densely covered with mostly pine and spruce trees, the characteristics of the site revealed themselves to us slowly over time. Over a period of several months we visited this site at regular intervals and discovered its subtle beauty and unique features and qualities, which included rock outcroppings, dense areas of mosses and ferns, and discrete views through the trees to the pond. We also discovered the way the sun moved across the site, where there were natural clearings for the house and solar exposure, and how the breezes changed during the course of the day, blowing cool up the hill from the pond in the afternoon.

Before the house was designed, the approach to the lower part of the site was created by way of a steeply sloped gravel driveway through this forest of evergreens. The entrance drive was laid out and designed by Michael Boucher Landscape Architects (MBLA), who had done a lot of high-end design work on the Island over the years. MBLA was very sensitive to the grading of the road and preservation of the natural landscape. When you travel the road today it looks like it has been there for over a century.

The road leads down to a spot on the site that the owners had identified as the probable site for the house. They had spent many weekends of the previous two summers camped out on the property in a canvas yurt exploring, swimming in the pond, and experiencing the way the sun passed over the site during the summer months. On our first visit to the site they explained what they had learned. The location of the house on the site would be dictated by a number of factors. Conservation easements were in place that required all structures to be

FIGURE 3: Site plan showing approach to house through forested hillside.

150 feet back from the edge of the glacial pond. Minimal clearing of the forest was allowed, meaning that a "house on the pond" was out of the question. At best, there would be limited views of the water through the mostly pine and spruce forest. (Figure 3)

Sun angles dictated that the house be oriented within 15 degrees of true south, to maximize the solar collecting potential of any south facing windows and the roofs. The only place on the site that had a clearing large enough to accommodate the solar angles, thanks to an enormous white pine tree that had fallen, was the area where we ultimately sited the house. This positioning gave us ample sunlight in the winter, as well as the other seasons, to passively heat the main living spaces and actively collect the solar energy needed to power the house. There was a wetland area traversing the north edge of this clearing that provided the water source for a dense blanket of undergrowth and moss typical of what you would find on an island in coastal Maine. Both were very important characteristics of the site that the owners and design team wanted to preserve. We also discovered that beneath the fallen tree was a ledge outcropping running diagonally through the site, another natural feature that everyone wanted to preserve and incorporate into the design of the house.

With these constraints in hand, the design team and owners began to develop sketches and studies to imagine how the house would be organized on the site. In subsequent weeks and months we would meet at the property to review and adjust the siting of the house. Each time we were able to fine-tune the location to maximize the solar orientation, the views through the trees to the pond, and the relationship to the contours of the site. Staking out the corners of the house at first, and then the primary rooms, we were able to imagine how the house and site would be married together, and how the sunlight would impact the quality of the interior and exterior spaces. Once the final stakes were set, and the owners and design team were happy with the relation of the house to the site, sun, and views, the surveyor came to the site and marked the stakes so we could accurately locate them on the site plan drawing. MBLA had worked with the best landscape contractors on the Island and contracted with them to harvest the existing groundcover and moss beds from the building site so they could be re-placed after construction was completed. They made good use of the wetland drainage

FIGURE 4: View to pond from house site.

area to the north of the site to store the materials and keep them alive and healthy during the twelve-month course of construction. They also worked with them to locate native, drought resistant plant materials to re-vegetate around the house after construction, restoring the natural look to the landscape that existing before we started and eliminating the need for irrigation and maintenance. (Figures 4, 5, 6)

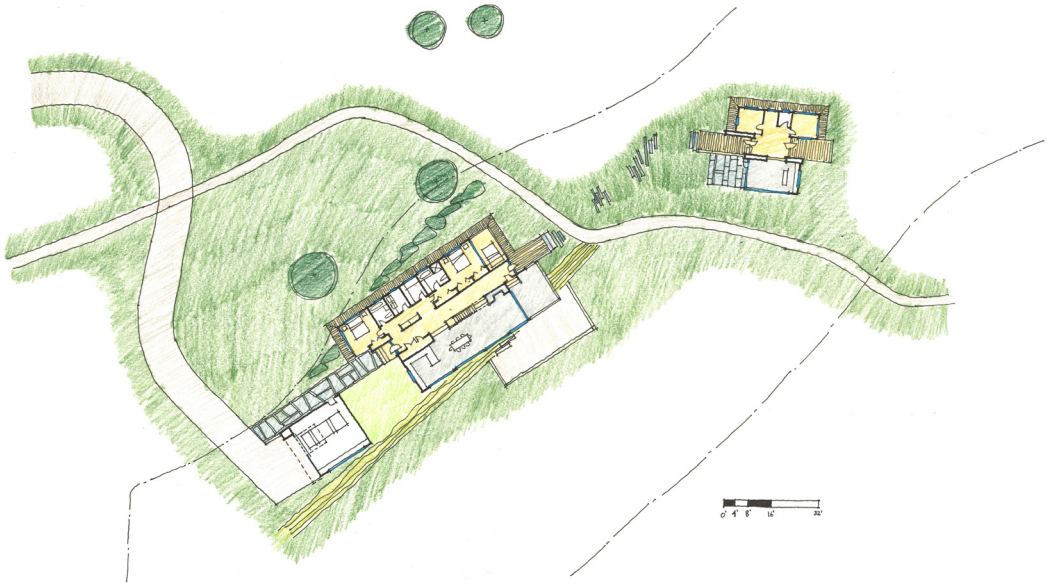
FIGURE 5: Staking out house footprint to get the solar orientation and views to the pond right.

FIGURE 6: Pathway to the pond form the house site.

DESIGN APPROACH AND PROCESS

With the site location and orientation decided, we started to develop the design for the house. From the start our goal was to design a building of exceptional beauty that would also perform at the highest level possible. The owners told us they wanted a modest house that touched the earth lightly. They admired Japanese teahouses and appreciated the way they floated over the landscape, creating a soft edge and transition between the building and the site. The original design imagined a series of smaller buildings arranged on the site. There would be a main house with living, dining, and kitchen spaces, a large screen porch, two bedrooms, two bathrooms, and an office. It would be no more than 2,500 SF. There would also be a guesthouse with a small living, dining, kitchen area, two bedrooms, and one bathroom, no more than 600 SF, and a separate one and a half car garage. We studied the site carefully to locate the ideal positions for these three buildings, and developed a site plan sketch that captured this idea.

FIGURE 7: Site plan and floor plans of early design concept.



The main house would have the major living spaces oriented along the south face of the building, facing the mountain views, the pond, and the sun. The north side of the building would have the bedrooms and bathrooms looking out towards the moss covered wetland areas. A sunlit space between the living spaces and sleeping spaces would bring daylight into the center of the house and connect it on either end to outdoor decks that would cantilever over the moss and fern covered landscape surrounding the house. The office would be on an upper level, in the treetops (the owner is a forester) looking out over the treetops to the mountains on the other side of the pond.

In the end, the owners did not like the idea of the sunlit space in the center of the house, thinking it would feel more like an office than like a house. We responded by reconfiguring the floor plan, pulling the living spaces and sleeping spaces apart to form two rectangular wings, and then connecting them with a glass "bridge". This allowed us to bring ample day lighting in on both sides of all the living and sleeping spaces, and to develop a lush moss and rock garden between the two wings that would be visible as you passed through the glass connected from one wing to the other.

We hesitated to proceed with this layout at first, concerned that we were creating too much exterior wall surface and potential heat loss. In the end, we decided to continue, believing that with an ultra tight envelope and triple glazed windows we would be able to compensate for the additional exterior surface area. We realized the living wing/sleeping wing arrangement would allow us to create two independent heating zones for the house that would be easy to control separately. We also realized that this arrangement would create the courtyard-like spaces on either side of the glass connector that would create a very strong, immediate connection to the natural setting, similar to the courtyards in the Japanese tea houses the owners admired. (Figures 8, 9)

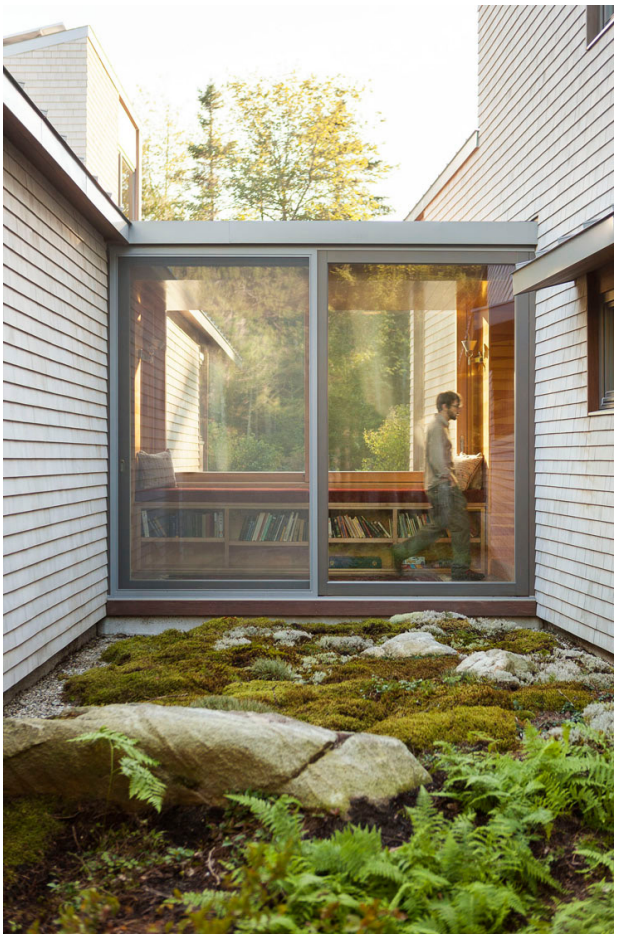


FIGURE 8: Glass connector between living wing and sleeping wing showing moss garden.

We proceeded with this revised layout for some time, developing the sections, the solar angles, and character of the spaces, and even receiving preliminary pricing from our contractor. In time, however, the owners decided it would be more environmentally responsible, and more cost effective, to combine the guest house with the main house and put the two guest bedrooms and bathroom on the second floor of the north wing. We added a stairway in the center of the north wing and located the bedrooms and bathrooms on the second floor, looking out over the first floor living spaces towards the mountains and the pond. This allowed us to reverse the slope of the roof on the north wing so it faced the sun and could hold the majority of the PV and solar thermal panels. We also reversed the slope on the roof over the office, so it could do the same. The final change was to connect the garage to the west end

FIGURE 9: Glass connector interior looking through dining room to outdoor deck and view to pond

of the living wing, with a direct interior connection to the entrance hall area. Instead of three separate buildings, we now had one building with two wings, one for living and one for sleeping, and a glass connector with intimate views out to the moss and rock gardens in between. We ended up with a 3,050 SF house that includes the main living spaces, three bedrooms, two studies, three and a half bathrooms, and a large screen porch on the east end of the living wing. (Figure 10)

As the design evolved we made a conscious decision to keep the building forms simple. Early on we studied many different roof configurations. (Figures 11, 12, 13, 14)

In the end we chose a single pitch roof form, which allowed us to lift the roof edges up to the south to open the house to the sun and views of the mountains and pond. We cantilevered the roof overhangs on the south, east, and west sides of the building and calibrated them to shade the summer sun. We elongated the sleeping wing to allow it to extend beyond the eastern end of the living wing, gaining a view of the pond from the master bedroom suite. We designed the exterior IPE decks off the living room and master bedroom to cantilever over the landscape of ferns and moss and soften the edge between the built and natural environments. The stone patio off the study on the first floor of the sleeping wing was designed to create a warm place on the west side of the house, a protected place away from cool breezes that come up off the pond in the afternoons. (Figures 15, 16)

At this point in the design process we revisited our initial energy and daylighting models, to help us analyze sun angles, window placement and sizes, and solar angles at different times of the year. Thanks to the help of our energy consultants at Thornton Thomasetti (formerly Fore Solutions in Portland, ME) we were able to fine-tune the design concept to maximize passive solar gain in the winter and minimize overheating in the summer. A direct outcome

FIGURE 10: First and second floor plans showing separation of living spaces from sleeping spaces.

FIGURE 11: Building section study with gabled roofs and skyights along ridges.

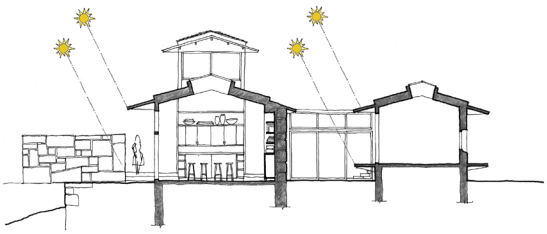


FIGURE 12: Building section study with shed roofs and clerestory windows.

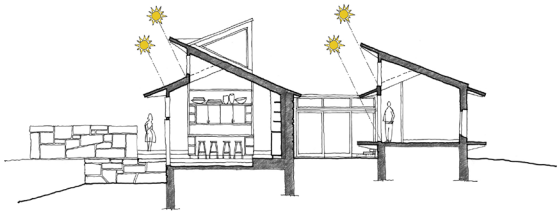


FIGURE 13: Building section study with asymetrical gabled roofs and sun shades.

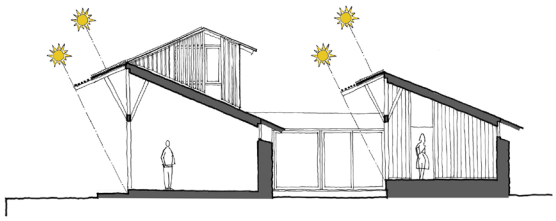
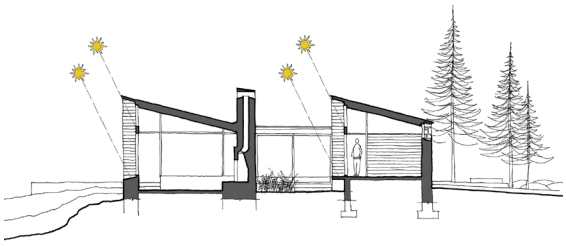


FIGURE 14: Building section study with simple pitched roofs and overhangs.



of the revised energy model was the recommendation to reduce the amount of glazing on the south façade of the living wing by 15%, which resulted in reducing the air infiltration by 50%. Another outcome of the revised daylighting model was the introduction of the shading device on the south wall and the elongation of the cantilevered roofs on either end of the sleeping wing, which helped to reduce solar heat gain in the summer (Figure 17). We studied several ways of heating, ventilating, and cooling the building. We had previous experience using air-to-air heat exchangers on another net-zero energy project in Maine, and decided to use that system for this house. The upfront investment is far less than geo-thermal, and the

performance more reliable in our part of the world. We decided to heat with radiant floor heating and ventilate/cool with the air-to-air heat exchanger system and natural ventilation.

We worked with a limited palette of natural materials to create this house: stone, wood, metal and glass. As the design progressed we reminded ourselves to keep it simple. We chose durable, time-tested materials for the exterior. We used the changes from white cedar shingles to hardwood siding to help define the window groupings and differentiate the areas of solid walls from the glass and window areas. We added a balcony to the study on the second floor so the owner could step outside in nice weather to be among his friends, the trees. We detailed the decks and stair treads to be thin at the edges so they would appear to float over the adjacent landscape, similar to a Japanese tea house, and made the handrails as light as possible by using stainless steel rails and cables. Walkways to the entrances, and site walls and benches, were built using simple slabs of local stone set directly on the ground, with recessed foundations.

On the interior the rooms were modestly sized to keep the house from feeling too large. We made the rooms feel bigger by giving them generous amounts of natural light and high ceilings. The ceilings in the living wing all slope up to the southern view, while on the second floor of the sleeping wing they slope to the north and views of the forest and hillside behind

FIGURE 15: Floating stair treads allowing ground cover to grow under them.

FIGURE 16: Rock out- croppings and mosses between living and sleeping wings.

the house. The sloped ceilings are all made with clear pine paneling, giving these rooms a wonderful sense of warmth and texture. Throughout the house the larger windows were placed to provide expansive views of the mountains and surrounding forest. By contrast, the smaller windows were located to create intimate views of the immediately adjacent landscape, like framed pictures, calling attention to the small details of the site. In every case the operable windows provide cross ventilation for natural cooling and bring the sweet smell of the Acadian landscape into the house. (Figures 18, 19, 20, 21)

MATERIALS AND CONSTRUCTION

The materials of the house are very straightforward. The foundation is a standard 8" poured in place concrete foundation wall pinned to ledge rock, which was discovered, to no one's surprise, a mere 6" to 30" below the surface of the moss and groundcover. The floors on the ground floor are concrete slabs on grade, with a vapor barrier and 4" rigid insulation below. In some areas, like the glass connector, the concrete is polished and exposed. All concrete was delivered with 25% fly ash content.

The walls, floors, and roofs are all wood frame using engineered lumber, as is the second floor framing, which is all engineered TJI's. All framing was accomplished using efficient framing techniques, which reduced the amount of framing material used. There are a few steel members in the house, spanning the sliding doors in the living room and forming the cantilevered roofs on either end of the bedroom wing. All the steel used had high-recycled content.

The exterior materials include painted steel standing seam metal roofing, stained white cedar shingles siding, FSC certified hardwood exterior siding, trim, and stair treads, triple

FIGURE 17: Small west facing terrace off guest bedroom for afternoon sun.

glazed windows and lift/slide doors by Drewexim with clad exteriors and natural wood interiors. We used locally quarried and fabricated stone walkways, steps, walls and benches for the exterior site work and stainless steel handrails around the main living room deck.

The interior materials include FSC certified clear pine wall and ceiling boards, painted gypsum drywall, FSC certified locally sourced maple hardwood strip flooring in the major living spaces, solid maple and maple veneer plywood cabinets, polycarbonate countertops by 3-Form, porcelain bathroom floors and wall tiles by MOSA Tile, very high efficiency plumbing fixtures by Duravit, and faucets and fittings by Grohe and Kohler. Kitchen countertops were made with locally sourced and fabricated stone.

The owners had seen and liked a house nearby that had an all-pine interior. They wanted the interiors of their house to be made with all clear pine boards from sustainable forests in Maine. Thanks to their help, we were able to find a good local FSC source for the material.

The construction of the house was more complex. We interviewed the most reputable builders in the area and selected Peacock Builders because of their experience with other finely detailed custom homes on MDI, and their passion for creating one-of-a-kind homes like Pondicherry. There was no challenge they did not attack with enthusiasm and determination, and they did a superb job building this house. It is put together like a Swiss watch.

To reach our target goals of Net-Zero Energy and LEED Platinum we chose to insulate the envelope with a combination of dense pack cellulose insulation and poly-iso exterior barrier insulation. The wood frame walls and roofs gave us the cavities for the cellulose; the exterior barrier insulation gave us the thermal break over the majority of the surfaces. Insulating the floor/wall and wall/roof connections to prevent any thermal bridging through the concrete was challenging. We developed many sketches to study these intersections and make sure we maintained a continuous insulating enclosure. Equally as important was the detailing of the air barrier to insure there were no gaps in the exterior wall enclosure where air could penetrate. The construction proceeded steady, with only a short break for the coldest months of the winter. Getting supplies to this remote site was challenging at times. There was very little space available near the building site to store materials and equipment, without disturbing more of the existing undergrowth. In many cases materials had to be moved around the site to create space for new materials coming in. Workman had to park partway down the entrance

FIGURE 18: Main living space with FST clear pine walls and ceiling.

FIGURE 19: Living room, fireplace and view out to screen porch.

drive, in a temporary parking area, to leave more space available for staging near the construction site. The construction took over a year to complete and we were not in a hurry to rush them at the end, when the detailed finish work was being completed. When the house was finished, the landscaping contractor and the team from MBLA came in to re-vegetate the site with material that had been harvested more than a year before. They brought in new materials too, and when they were finished the site was well on its way to being restored to its original condition. Two and a half years later, the ferns are thick and lush, small pine trees are shooting up everywhere around the house, and it looks like the house just grew out of the landscape.

ACHIEVING NET-ZERO ENERGY AND LEED PLATINUM

Net-Zero Energy and LEED Platinum are very high bars, and require the dedication of all team members, including the owners, to achieve. We always say, "It takes net-zero occupants to create a net-zero building" because it requires people to change the way they live in the building to insure it performs at its optimal level. In the case of this house the owners have to remember to open the canvas shade in front of the sliding glass doors on sunny summer days. They have to take shorter showers and remember to open the windows at night to cool

FIGURE 20: Living room window looking down at rock outcroppings, mosses, and ferns.

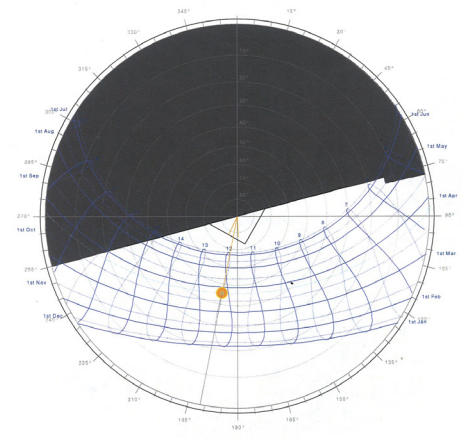
FIGURE 21: Bathtub with low windows looking out to mosses, ferns, and evergreen forest.

the house down. And they have to have a long-term view when it comes to energy consumption, because the commitment to create a Net-Zero Energy/LEED Platinum house requires an upfront investment to achieve the desired outcome.

During the design process we discussed alternative approaches to achieving this goal, and decided to use the sun to create electricity and hot water for the house. Knowing that we would need to initially maximize the sun's potential for passive solar heating, and later for active collection of solar energy, a clear understanding of how the sun moved across the site, when it would be blocked by trees, and how it would change throughout the year was critical to the design of the house and its orientation on the site. The site sits at 44.4 degrees latitude, and surprisingly on Mount Desert Island, which is in IECC Climate Zone 6, there are over 200 days with sunlight a year.

A year before we designed this house we had designed the Education Center at the Coastal Maine Botanical Gardens (CMBG) in Boothbay, Maine, which is also Net-Zero Energy and LEED Platinum (Maine's first, designed in collaboration with Bill Maclay Architects), so we knew we could achieve Net-Zero with a well designed envelope, proper solar orientation, photovoltaic panels, and high performance air-to-air heat exchangers. For both Pondicherry and CMBG we worked with Gunnar Hubbard and his team at Thornton Tomasetti (TT) Energy Consultants. TT is one of the leading energy consultants in the US, and we are very fortunate to have them located here in Portland, Maine. They prepared detailed energy and daylighting models at two different intervals during the design process that were extremely helpful tools for improving the performance of the house. (Figures 22, 23)

Our first challenge was to figure out how to balance the desire to take in the spectacular views of the mountains and abundant daylight with the requirements of a tight, well-insulated envelope. At Pondicherry, the first strategy was not to eliminate the abundant south facing glass, but to offset it with more modest windows on the north, east, and west sides of the house. Our goal was to have the total glass area to be less than 30% of the exterior envelope.



An obstacle free south facing facada has good solar exposure and allows higher solar gains in the heating season. Windows on this facade will play an important role in reducing heat loads.

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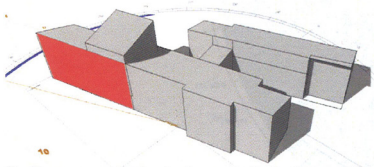
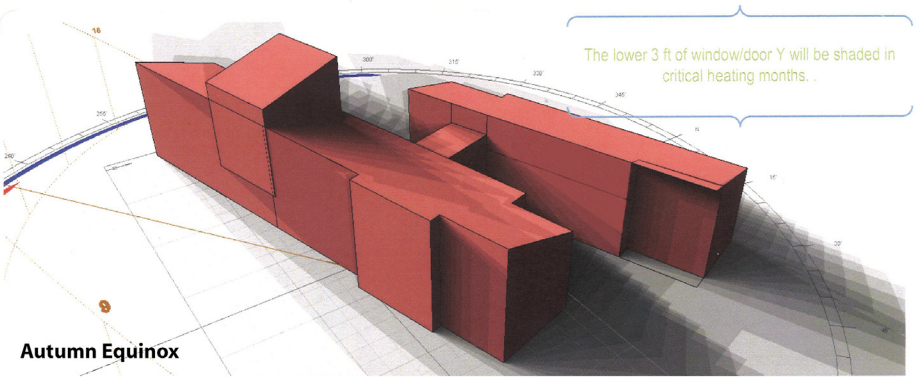


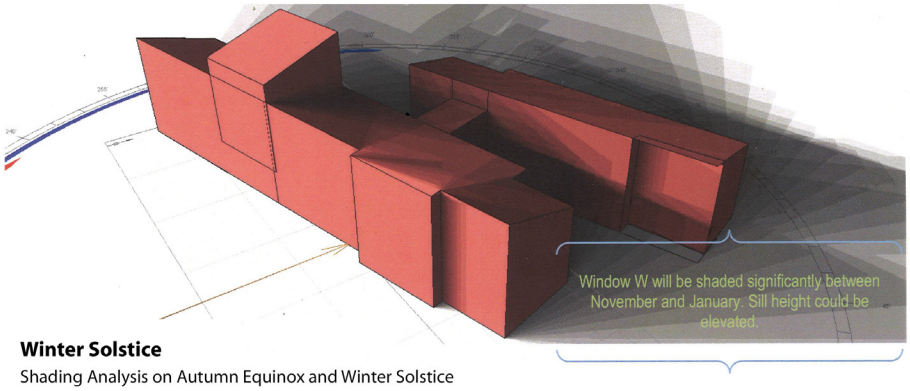
Solar path diagram – obstacle-free south facing wall.

FIGURE 22: Early sun study showing solar path and building orientation.

FIGURE 23: Early sun shading analysis at equinox and winter solstice.



Autumn Equinox



Winter Solstice

Shading Analysis on Autumn Equinox and Winter Solstice

In the final design we ended up with 29% total glass area, which is noteworthy, given the expansive views and open feeling of the house. We completed an energy model at the end of design phase, and achieved a remarkably low HERS Index of 24, as determined by our independent Home Energy Rater, Horizon Energy in Portland, Maine.

Horizon was responsible for LEED verification and certification. They worked closely with us throughout the design and construction processes to keep the design team on track and informed about where we stood relative to our LEED points and certification goals.

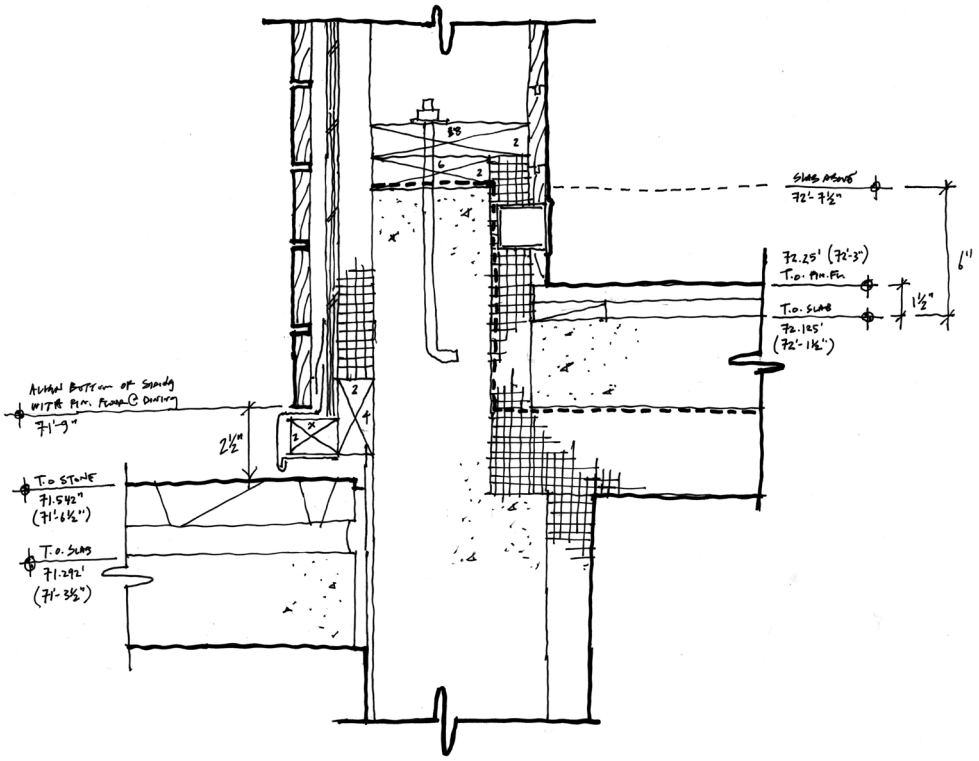
The LEED system rewards points for locally sourced materials, products with high-recycled content, and readily renewable resources, and we used them whenever we could. As mentioned under Materials and Construction, we used FSC certified lumber for the interior finishes and IPE siding, engineered lumber for the framing members, local stone for the countertops, site walls, and patios, high recycled content steel, and fly ash concrete.

For insulation we used dense pack cellulose in the stud and rafter cavities and poly-iso insulation on the exterior of the walls, under the slabs, around the foundations, and wrapping the steel elements. The finished house has R-52 roofs, R-37 walls, R-20 below the slabs, and R-5.75 triple glazed windows. Equally as important, all intersections and details were carefully detailed to provide air barriers that reduced air infiltration to 1.30ACH50. Blower door tests were performed at three different times during construction, to insure all gaps in the envelope were sealed.

One of the most difficult intersections to detail in a high performance house is the intersection between the floor, foundation, and exterior wall. Special attention was given to this intersection, as well as the one between the top of wall and roof framing (especially over the lift/slide doors where there is a large steel beam) to make sure there was no thermal bridging or air infiltration. This sketch (Figure 24) shows how the insulation overlapped the foundation wall and slab intersection, to eliminate any thermal bridging. It also shows how the air infiltration barrier was wrapped under the floor slab, then over the foundation wall, where it would be overlapped by the exterior air barrier in the wall system, to eliminate air infiltration at this intersection.

The roof on the south edge of the living wing was tipped up to maximize the views to the mountains and lake, but also to allow for passive solar gain during the winter months. Studies were done to determine the best way to shield the expansive glass on the south side of the house from the summer sun. In the end the decision was made to protect the clerestory windows with the roof overhang, and to shade the large sliding doors with an operable canvas awning (Figure 25). Eastern and western exposures were protected with cantilevered roofs that extended six feet beyond the glass. The roofs were sloped to the north to deflect winter winds, and there are fewer windows for more privacy and to reduce heat loss (Figure 26). A 7.6 kW array of photovoltaic panels generates all the electricity needed to power the house, and solar thermal panels produce all the hot water required. Ventilation and cooling are supplied by high performance air to-air heat exchangers, while heating comes from radiant hot water heating in the floors. To maximize the efficiency of the radiant floor heating, we installed Warmboard subflooring, which has an integral aluminum surface to distribute the heat across the flooring. Water comes from a drilled well on the site. For water conservation we used ultra low flow/dual flush toilet fixtures by Toto. Wherever possible we used LED lighting fixtures and Energy Star rated appliances.

FIGURE 24: Section detail at foundation/floor/wall intersection showing insulation and air barriers.



WHAT WE ACCOMPLISHED AND WHAT WE HOPE TO DO BETTER IN THE FUTURE

We tracked the performance of Pondicherry during its first year (2012/13). This was a typical twelve-month cycle in Maine, with near normal degree-days and sunlight. It was slightly warmer than average, which certainly helped on the heating side of the equation, but otherwise it was a normal year. Based on invoices from the local utility company, the house produced approximately 5% more energy than it consumed, making it a Net-Positive Energy home. We also collected the results from the second year of operation, 2013/14, which showed that the house again produced approximately 5% more energy than it consumed. Needless to say we are very pleased with the results of this project from a green building perspective. But we are even more pleased that we were able to accomplish our ultimate goal of producing an aesthetically unique and modern house that was as high performance as anything that had been built to date in the northeast. We had seen several houses that were Net-Zero or LEED Platinum in our area, but none of them were as complex and challenging as Pondicherry. With this house we proved to ourselves and our colleagues that a net-zero house doesn't have to be a rectangular box with small windows. It can be a unique modern design with expansive glass on the south side, so long as it has a high performance envelope (reducing loads), pays close attention to the construction details throughout (reducing air infiltration and thermal bridging), and collects enough sunlight to power the house (alternative energy source).

To be honest, achieving our Net-Zero Energy goal was in some ways easier and more direct than achieving our LEED Platinum goal. Our net-zero approach and process involved

conversations and calculations related to energy saving features and details, whereas our conversations about LEED Platinum frequently involved how we were going to get the points (our target was 96.5 LEED points and we ended up getting a total of 91.5 points). The two goals worked hand-in-hand once the commitment was made to design for net-zero energy. For example, once we had the net-zero energy envelope designed and the air-to-air mechanical strategy in place, it was easy to get the maximum LEED points for Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality.

We are working on a number of high performance building projects this year, including a PassivHaus dormitory, a LEED Gold (or better) school, and a LEED Gold (or better) library. From our perspective, achieving these targets gets easier and easier. The cost of photovoltaic panels is dropping and the public awareness is rising. The lines are crossing, making high performance buildings like Pondicherry more and more possible with each passing year.

The performance results speak to the attainment of our energy goals. Net-Positive Energy by 38% and LEED Platinum (91.5 points) are very high marks for this small house in Maine. We also place a high value on our client's satisfaction, and we can say without hesitation that they are thrilled with their house. Last summer they spent five weeks in the house and sent an email saying how happy they were living there. It was a wonderful collaboration, with everyone contributing to create something extraordinary. Our thanks to everyone who worked on the project, the owners, our design team, our consultants, and the skilled craftsmen who actually built the house. It was a team effort in the best sense of the word. Everyone did his or her part.

In closing I would like to share a quote from a person who saw this house on the World Architect's "Building of the Week" website, which I think captures the spirit of the house, and speaks to the success of its aesthetic and design goals:

> *This building integrates nature's elements of light, earth, granite, the sea, and trees in a palpable, graceful form.*
>
> *The space provides more than a respite for occupants, it offers food for the soul. Regeneration, inspiration, warmth, strength, and nourishment of ones essence at every turn.*

FIGURE 25: Retractable awning provides shading for large lift-and-slide doors in dining room.

FIGURE 26: North façade with smaller windows and lower roofs sloped to deflect north winds.