narrative

TITLE **HOME SWEET HOME**

SITE

Marcia + Gary Levesque
69 Fox Hill Road
Marlow New Hampshire 03456

APPROACH

Why is maple syrup different colors?

This is a question a child might ask. Maple syrup is made by collecting and boiling sap from a maple tree. It is a simple process that removes water while leaving the sugar intact in the form of syrup. Earlier in the season, the syrup has a golden color. However, later in the season, the syrup color shifts to amber, then brown and finally nearly black. Clearly there is another factor to consider. As the season progresses, rising temperatures promote an increase in the microbe population inhabiting the tree sap. As the sap boils, these microbes break down the sap's sugars into simpler components that are more chemically active. Increased microbial activity darkens the syrup altering its flavor. Design is also a process with varying results, not the creation of a product. The design proposed here is the latest step in an ongoing process. The drawings are a gathering of ideas that have yet to encounter the site and the clients in the flesh. Much like microbes in tree sap, the site and clients must have the opportunity and to activate the architectural design.

BUCKET 1: LANDSCAPE

The focus of the design is the revitalization of a decommissioned sugar house. The sugar house emerged from a connection to the surrounding terrain. It served as the gathering point for sap collected from eligible maple trees presumably found on the 8-acre property that belongs to Marcia and Gary. To preserve and extend the house's connection to the surrounding landscape, we are proposing a line of twelve maple trees along the edge of the driveway leading to the rejuvenated sugar house. These trees form the edge of a half-acre "ghost orchard" that will be marked with a grid a stone slabs set in stand of trees to the south of the cabin. Closer to the sugar house, a series of furrows extending from the kitchen volume mark a 500 square foot vegetable garden that will be a source of exercise and nutrition for the venerable occupants. Finally, between the sugar house and the main residence, there is a milkweed meadow to attract migrating monarch butterflies, who lay eggs only on the undersides of milkweed leaves. The meadow also frames the new pedestrian path from the main residence to the sugar house. These landscape interventions operate on a continuum from the road (a cultural element) to the forest (a natural element) with the sugar house as the fulcrum.

BUCKET 2: LIVING VOLUME

The existing structure consists of an evaporator room and a sugar kitchen. Along the eastern side of the house, a shed shelters firewood. This shed will be dismantled and reassembled in front of the main cabin facing the driveway to provide a covered entry for people arriving by car or on foot from the main residence. The evaporator room is the living room with the sugar kitchen transformed into the kitchen. All wall and roof cladding will be removed from the outside of these volumes and reattached following the installation of wood fiber insulation on the walls (5½" thick) and roof (13" thick). Wood fiber has a superior carbon footprint compared to all traditional insulating materials and rigid foam, in particular. Timber HP, based in Maine, is the first company in North America to produce this type of insulation that has been readily available in Europe for decades. Placing all insulation on the building exterior allows the interior wall framing and roof trusses to remain exposed and preserve the rustic character of the sugar house. To provide a refined appearance, interior wall surfaces will be painted a light amber color reflecting the underlying wood tones and invoking the prior maple syrup production.

BUCKET 3: BATHING VOLUME

Tucked behind the existing structure is the new bathroom. The volume is compact (75 square feet) but also spacious enough to include the complete wheelchair turning radius, which has recently increased to 67" in diameter. The room is flooded with natural light entering a pair of windows below

and a skylight over the shower alcove. To avoid the challenge and expense of a new septic system, the bathroom incorporates a composting toilet. Biolet, a Swedish company, has been refining this technology since 1972. A touch of playfulness is introduced by colorful bars from Hewi that wrangle towels and toiletries while also securing the shower head and providing hand holds for balance.

BUCKET 4: SLEEPING VOLUME

Peeking out from behind the sugar house and glancing toward the main residence is the new bedroom (150 square feet). The room is graced with a cathedral ceiling, a large corner window looking out onto the woods and a door providing direct access to a patio which provides a place of honor for the lone maple tree just east of the sugar house. To tackle budget constraints, this volume could be eliminated from the project or developed later. Both the bathing and sleeping volumes will be clad in reclaimed wood using a horizontal pattern to distinguish the new volumes from the existing sugar house which is finished with vertical siding. The pitched roofs will be covered with standing seam metal, once again to make a subtle distinction between old and new. The roofs have a single pitch which makes the volumes incomplete in contrast to the full gable of the sugar house's main façade.

BUCKET 5: SYSTEMS

Building systems are the unsung heroes of any contemporary home. This work begins with a feature that has a long history of use in buildings - openings. The modified sugar house and the proposed additions contain numerous windows and skylights to ventilate and illuminate the interior without recourse to modern equipment. To supplement traditional passive systems, the new house will use only electric power. Heat for thermal comfort, hot water and cooking will all be generated by innovative electric equipment - heat pumps and induction appliances. Ephoca, an Italian company, makes a self-contained heat pump module that connects directly to the exterior, eliminating the need for bulky condensing units and tangles of refrigerant piping. The work of this machine will be augmented by an energy recovery ventilator providing fresh air to the interior. The new house will conserve water. Storm water from the new bathing and sleeping volumes will be collected in a tank located on the main circulation axis visible from the moment one enters the house. This water will be used to irrigate the vegetable garden. The new windows dotted throughout the house will diminish the use of artificial lighting. When electric lighting is needed it will be delivered by light emitting diode (LED) fixtures.

BUCKET 6: MATERIALS

Natural materials such as reclaimed wood and biobased insulation on the exterior connect the home to the surrounding landscape. These materials offer superior embodied carbon values, frequently are more durable than manufactured products and are much easier to recycle or left to biodegrade at the end of their functional life. Inside, the existing concrete slab in the sugar house will be finished with end grain wood blocks which are created by slicing the tree like a loaf of bread and brandishing its growth rings. The floors of the new volumes are covered with cork, which is soft underfoot, acoustically pleasant and again resonates with the woodland setting.

CHALLENGES

A notable site challenge is the location of the septic system uphill from the sugar house. The new dwelling uses a composting toilet for human waste and diverts all grey water to a dry well. The preservation of the existing maple tree adjacent to the wood stockpile is another constraint. The tree precludes the construction east of the sugar house. In the proposed design, the tree is the focus of an outdoor patio space connected to both the living and sleeping rooms. This space allows the sugar shack's occupants to enjoy the outdoors as they advance in age. Salvaging and adapting the sugar house will be an ongoing trial. Assessing the quality of the existing structure and cladding materials will require a careful attention to detail both prior to and during construction. A final challenge worthy of note is the inherent conflict between affordability and universal design. An affordable project favors more compact spaces which require less material to build. An accessible house prefers a looser fit. In the instance of the wheelchair turning radius, it demands generosity. The proposed design relies on clear and direct paths of movement to strike a balance between efficiency and spaciousness. There is a primary axis of movement from the front door across the old evaporator room to the back of the house where there is a perpendicular implied corridor linking bathing and sleeping. Parallel to the entry axis there is a second path of movement that links the front porch to the bedroom via the patio.

COST ESTIMATE

BUCKET 1: LANDSCAPE

32	Exterior Improvements	$	18,000.00
	• Trees / Garden		
	• Patio		
	• Meadow		
SUBTOTAL		**$**	**15,000.00**

BUCKET 2: LIVING VOLUME (305 SF)

01	Foundation and Shell (reuse existing sugar house)	$	-
06	Wood Plastics + Composites	$	15,250.00
07	Thermal + Moisture	$	5,400.00
08	Openings	$	6,800.00
09	Finishes	$	5,600.00
11	Equipment	$	2,500.00
SUBTOTAL		**$**	**35,550.00**

BUCKET 3: BATHING VOLUME (75 SF)

01	Foundation and Shell	$	1,500.00
06	Wood Plastics + Composites	$	5,400.00
07	Thermal + Moisture	$	1,400.00
08	Openings	$	4,800.00
09	Finishes	$	10,200.00
SUBTOTAL		**$**	**23,300.00**

BUCKET 4: SLEEPING VOLUME (200 SF)

01	Foundation and Shell	$	6,900.00
06	Wood Plastics + Composites	$	14,200.00
07	Thermal + Moisture	$	4,600.00
08	Openings	$	7,800.00
09	Finishes	$	5,600.00
SUBTOTAL		**$**	**39,100.00**

BUCKET 5: SYSTEMS (580 SF)

22	Plumbing	$	14,600.00
23	HVAC	$	10,800.00
24	Electrical	$	7,400.00
SUBTOTAL		**$**	**32,800.00**

General Requirements		$	20,000.00
GC overhead (10%)		$	14,400.00
GC profit (5%)		$	7,200.00
TOTAL CONSTRUCTION COST		**$**	**187,350.00**

Energy Tax Credits + Rebates (Federal)		$	(3,200.00)
Efficient Home Improvement Tax Credits			
Heat Pump	$ (2,000.00)		
Exterior Doors + Windows	$ (1,200.00)		
TOTAL PROJECT COST		**$**	**184,150.00**