House on The River

Concrete piers, cantilevered steel and prefab framing support a rustic hideaway

by Steve Taylor

This story takes place on and because of the St. Lawrence River and, in particular, its majestic headwaters. Here, for a stretch of 60 miles, waters from the Great Lakes flow around more than 1,500 islands en route to the sea. These granite islands, formed during the close of the last Ice Age, are home to hardwoods and softwoods, summer sun and winter ice. The border between New York state and Ontario, Canada, winds through here now.

Most of the families in this river community have been coming here for generations. Dick and Carol Munro are no exception. My crew and I know them well because we've worked with them in the past, remodeling their house on Bluff Island and building an adjacent floating boat house for them, among other things. Based on our earlier work, the Munros asked us in the fall of 1988 to design and build for them a new three-season (spring-summer-fall) guest house a few hundred feet away from the remodeled main house.

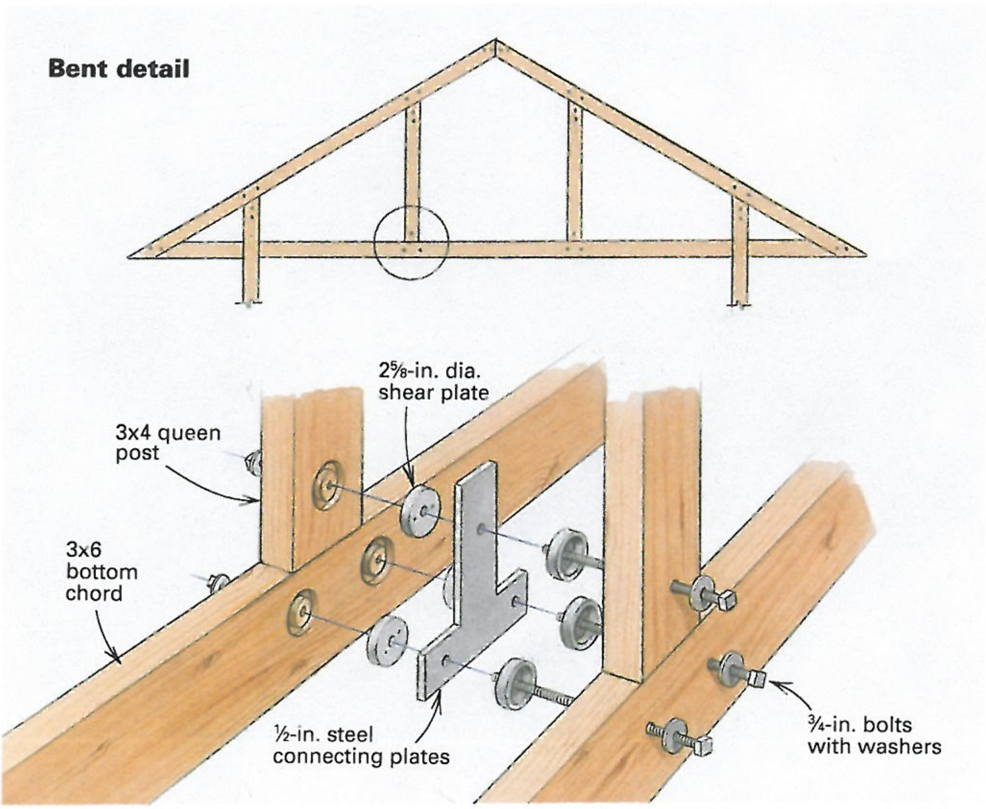
Given the remote and unspoiled nature of the site, we knew that both the design and construction of this house would offer a challenge. In fact, neither turned out to be conventional; many of the sturdy, singular structural components that bond the house to the rugged terrain double as strong aesthetic elements, which produce the honest, rustic (but not rough) appearance that we were looking for.

Surveying the site—We picked the ideal spot for the guest house: a north-facing point that offers a panoramic view of open water and distant islands and captures magnificent sunsets during half the year. The point is thick with a mix of hardwoods, hemlocks and pines, with cedars holding the banks.

We hired local surveyors to produce a topographical map of the point showing elevation

Above water. **Amply glazed to fetch views of the river, the house sits atop an undercarriage of rectangular steel tubing that cantilevers over the bank to support cedar decks.**

Modular rusticity. **The living areas are unified beneath shop-built bents, spaced 6 ft. 8 in. o. c. to accommodate stock Andersen windows. A native-granite fireplace with a glazed chimney cricket up top occupies one module. The stair (right in photo) leads to a loft over the dining and kitchen areas.**



changes in 1-ft. increments. The map cost only $650. On it we indicated the direction of sunrises and sunsets at the equinoxes and the summer solstice, as well as other significant features such as a gulley that bisects the point and drains rainwater and spring runoff from higher ground. We then drew a number of site elevations (sections through the land) to give us a thorough understanding of the site.

Open plan, modular layout—Based on this information, we decided to place the house at the top of the bank about 20 ft. above the river, bridging the gulley. This would provide the house with a relatively flat yard on the south side and superb views of the river to the north.

The house is L-shaped, following the configuration of the bank (floor plan p.75). One wing is perpendicular to the river and contains a living room, a dining area, a kitchen and an open loft. The other wing, which is parallel to the river, holds a master bedroom and bath, a smaller bedroom and a second bathroom. The living room and both bedrooms open to the outdoors.

From the river, the house looks like a pavilion, with walls in the living areas composed mostly of glass (photo previous page). Decks cantilever out over the bank like pine boughs reaching for concrete and block were troweled with Conproco Foundation Coat (Conproco Corp., P. O. Box 16477, Hookset, N. H. 03106; 603-626-5100), a fiberglass-reinforced concrete coating. We colored the coating to blend with the local granite. Though this product provides structural reinforcement for masonry walls, we applied it primarily for aesthetic reasons.

Insulation support—We fastened 2x6 pressure-treated plates to the top of the beam system with powder-activated, stainless-steel fasteners, then toenailed floor joists to the plates. Floor framing consists of 2x10 Western spruce joists for the house and 2x8 pressure-treated joists for the decks, all spaced 16 in. o. c. The 2x10s are topped with a ¾-in. T&G plywood subfloor, and the 2x8s with 5/4x6 cedar decking.

We nailed 1x3 cleats near the bottoms of the 2x10s to support loose panels of ¼-in. tempered pegboard, which in turn support 5½-in. fiberglass batts. The pegboard protects the insulation, but allows it to dry out should it get wet.

Building bents—Meanwhile, back at our shop, Bill Strodel supervised the manufacture of parts for the bents. We settled on the use of bents for aesthetic reasons—namely, to reinforce the modular layout of the house. Built of Douglas fir, the two-layer bents consist of double 3x8 top chords; double 3x6 bottom chords and posts; and double 3x4 queen posts and webs (drawing p. 72). Strong joints were achieved by running ¾-in. square-head bolts through custom-made, ½-in. thick steel connecting plates sandwiched between the layers. High-stress joints at the perimeter walls, eaves and other critical points are reinforced with two 2⅝-in. TECO shear plates per bolt (TECO, P. O. Box 203, Colliers, W. Va. 26035; 800-438-8326). Shear plates are circular metal connectors that ride in grooves cut in the timbers; the plates distribute compression loads and shear forces (for more on metal connectors, see *FHB* #43, pp. 44-49). The grooves are cut with a cutter head, a special tool resembling a hole

A transparent cricket

A cricket, or saddle, is a small gable that diverts rainwater around an obstruction, typically a chimney. We wanted to make the chimney cricket for this house out of glass to allow natural light to wash down the stone face of the fireplace. No millwork company we contacted wanted any part of the idea.

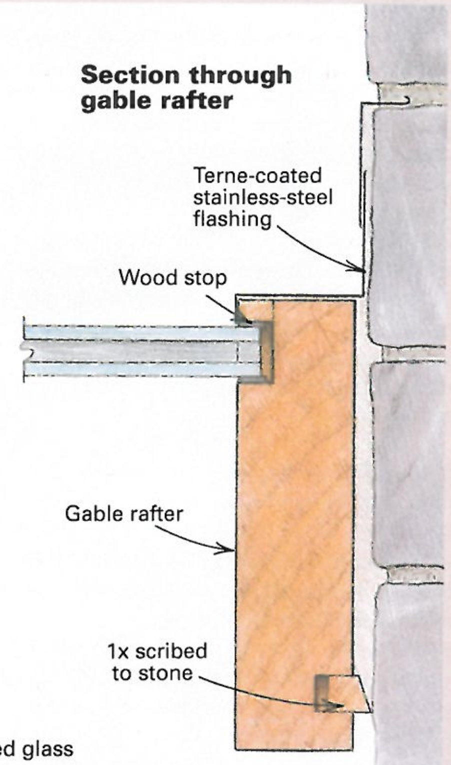
We found a glass company (Paragon Glass, Inc., 210 Factory St., Watertown, N. Y. 13601; 315-782-6300) that offered to make and install glazing for the cricket, provided we framed the opening. They would help us work out the framing details. We accepted.

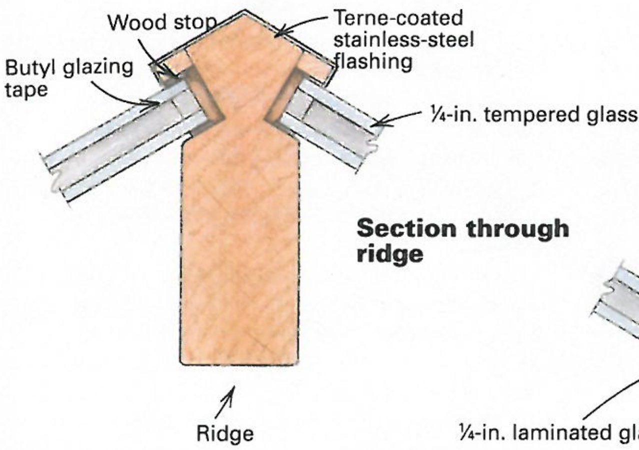
The framing (drawing right) consists of two gable rafters, two valley rafters and a ridge beam supported on one end by a triple 2x header nailed on either end of a roof truss. The valley rafters are raised above the roof plane and machined at the tops to accept valley flashing and grooved near the bottoms to support the roof deck. The top of the ridge beam and gable rafters are rabbeted to receive the glazing panels.

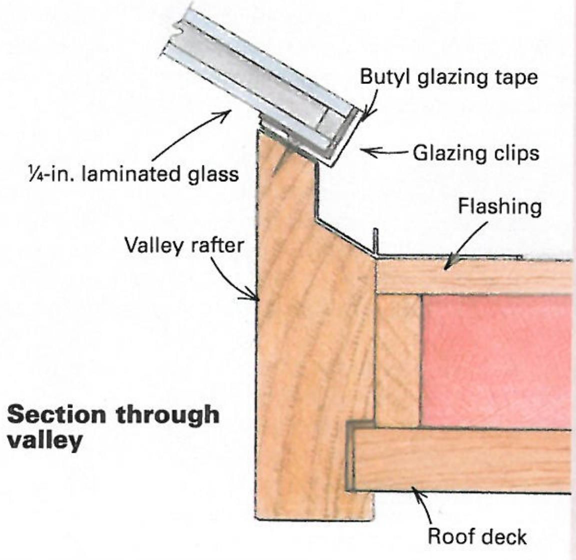
The glazing itself consists of two triangular, double-glazed, 1-in. thick, low-e glass panels. The tops of the panels are ¼-in. tempered glass to withstand impact from above, and the bottoms are ¼-in. laminated safety glass that won't shatter and fall if it's broken. The panels are bedded in butyl glazing tape and supported at the valley rafters with aluminum clips. The skylight is flashed at the chimney, ridge and valleys with terne-coated stainless-steel flashing.

The final effect is of clean structural members that are glazed to let light in from above (photo above). The total cost of the glazing was $543.50, including installation, but not including our structural work. *—S. T.*

The glazed chimney cricket allows direct sunlight to wash down the face of the fireplace.







light. The roof overhangs are 4 ft. 6 in. wide, sufficient for sheltering an exterior cantilevered walkway on the north side of the bedroom wing and a generously glazed interior hallway on the south side. This hallway adds passive heating (circulated by convection) during early spring and late fall, when leaves are scarce and the sun is low in the sky. The kitchen, too, is bumped out under the eaves at the southeast corner of the house so that its south wall is directly in line with that of the hallway.

To add visual interest by creating repetitive structural elements, we laid out the house on a 6-ft. 8-in. module. This measurement was determined by the size of the standard Andersen windows that we selected to optimize the view plus the thickness of the shop-built truss/post units, or *bents*, that would support the walls and roof (more on those later).

Many of the finest homes on the islands, built around the turn of the century, have native-granite fireplaces, weathered or stained wood siding and cedar-shingle roofing. The interiors of these homes are typically wood-paneled, often with beaded pine. We chose to incorporate these materials into this house.

Charles N. Timbie of C. N. Timbie Engineers, Inc. in Lansdowne, Pa., worked out the structural details for the house. Laying out everything on the module, he designed a concrete-pier foundation that anchors the house to bedrock, cantilevered steel beams that support the floors and decks, and the bents.

Floating and hovering—Building on islands in the north country can be fun, but it isn't always easy—especially when you work year-round like we do. We figured the Munros' house would take nearly nine months to complete, so we planned to work on it straight through winter.

Our office and shop are situated next to a small dock on another island that is connected by bridges to the U. S. and Canadian mainlands. During most of the year, we use a scow (a flat-bottomed boat with square ends) and several smaller work boats for transporting workers and building materials to job sites. For transporting heavy equipment and other hefty loads, we hire two mighty Navy-surplus landing crafts.

These boats aren't of much use in winter, however, when the St. Lawrence River typically freezes over. That's when we use Hovercrafts or snowmobiles and sleds, depending on the condition of the river.

For winter travel to the Munros' site, we used a Hovercraft if we were likely to encounter both open water and ice. A Hovercraft is propelled by a snowmobile engine that drives a large fan and provides about 10 in. of lift. We traveled by snowmobile and sled in colder conditions.

Piers to bedrock—We broke ground in late September. Test holes revealed that bedrock lay beneath 8 ft. to 12 ft. of sand and clay—unusually deep for this area. Timbie specified a foundation consisting of 24-in. square concrete piers anchored to bedrock to resist and help thwart erosion of the bank. The south wall of the house lies on relatively flat ground, so it's supported by a pair of concrete-block walls bearing on concrete footings 4 ft. below grade. A 13-ft. 4-in. wide gap (two modules) between the walls allows the gully to pass through. A concrete-block foundation also supports the fireplace and extends down to bedrock.

Foundation trenches were excavated with a backhoe. At each pier location, we drilled two ⅞-in. dia. by 8-in. deep holes in the bedrock and dropped a Chem-Stud epoxy capsule (The Rawlplug Co., Inc.; 800-243-8160) into each one. Then, using an electric drill, we spun a 22-in. length of ¾-in. galvanized threaded rod into each hole, breaking and mixing the epoxy capsules and bonding the threaded rods to the bedrock. The threaded rod extends far enough out of the bedrock to anchor 3-ft. square by 8-in. high concrete footings and to tie off ¾-in. rebar cages that extend up through the piers.

We formed the piers with Symons forms (Symons Corp., 200 East Touhy Ave., Des Plaines, Il. 60018; 708-298-3200), plywood-sheathed metal frames that are drawn tight at the corners with metal wedges. Brackets welded to the outsides of the frames accommodate 2x4 wales that align and reinforce adjacent forms. We rented the forms from a local tool-rental outfit.

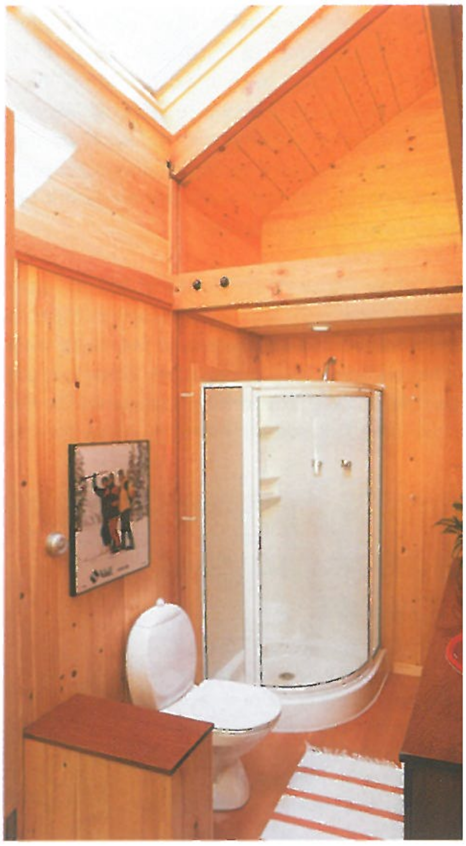
Concrete was poured into each form to an elevation just below the bottoms of the steel floor beams that would sit on the piers. Anchor bolts embedded in the tops of the piers would secure the beams to the piers, and steel shims and a nonshrink-mortar grout would be used to support the beams at the correct elevation.

Cantilevered steel—With the foundation work in progress, Williams Marine Service (Ivy Lea, Ontario, Canada) fabricated and primed the 6x14 hollow structural steel beams. We chose ⅜-in. thick rectangular structural steel tubing over more conventional steel I-beams because tubing is stronger, an important consideration with beams that cantilever up to 13 ft. 4 in. Not only does tubing have the equivalent of two webs as opposed to the single web of an I-beam, but it's made out of higher-grade steel than I-beams (ASTM A 500 steel, which is rated at 46,000 psi, as opposed to ASTM A 36 steel, which is rated at 36,000 psi).

Also, I-beams have an industrial look, and we would have wanted to conceal them, which is a time-consuming and costly process. Tubing, on the other hand, looks more refined. We had each beam tapered at the ends for a length of one module, which makes the cantilevers appear more delicate.

The steel beams were loaded onto our scow, cleared through U. S. Customs and floated to the island, where they were installed by the excavator. The beams were fastened with the anchor bolts to the piers through predrilled ½-in. thick steel plates welded to the bottoms of the beams.

After the beams were installed, the prime coat was touched up, and two coats of Pettit's Marine Epoxy Paint were applied (Pettit Paint Co., Inc., 36 Pine St., Rockaway, N. J. 07866; 201-625-3100). Concrete blocks were then cut and laid on top of each pier to conceal the anchor clips and cradle the beams. That done, the exposed



Showering in the sun. **Daylit by a skylight, the main bathroom features built-in incandescent lighting above and below the soffit, an Ifo low-flow toilet and a quarter-round shower.**

Indirect incandescents. **Interior soffits throughout the house are fitted with dimmable linear incandescent lighting fixtures concealed beneath plastic grilles. These fixtures are quieter than dimmable fluorescent fixtures, and the incandescent bulbs butt together for unbroken illumination.**

saw that's available from TECO. The ½-in. voids between the two layers are filled with strips of Douglas fir.

The bents were shipped in pieces to the job site, assembled and then raised with the help of block and tackle. Once all the bents were raised, we connected the bottoms of the posts to the rim joists with TECO prepunched truss plates and added temporary bracing where necessary. Finally, we installed a 3x8 ridge beam in precut notches at the tops of the trusses.

Closing in on winter—With the bents installed, we raced to get the house under cover before winter. Over the top chords, we installed exposed 2x6 T&G white-pine roof decking, 2¾-in. thick urethane foam insulation and 15-lb. felt. Large blue reinforced-polyethylene tarps were spread, tied and strapped over the whole thing for added protection. The finish roofing would be deferred until spring when it could be done more efficiently.

Meantime, mason Clyde LaGraves built the fireplace, which fills one module (photo p. 72). We picked the pinkish-colored granite for it—including a 700-lb. lintel stone—from a local quarry that closed more than 40 years ago. The mortar was colored to look old by adding 6 heaping tablespoons of dry, black cement coloring and 2 heaping tablespoons of dry, red cement coloring (both supplied by a local masonry supplier) to 5 gal. of water, which, in turn, was mixed with the mortar. We raked the joints so that the granite rocks are in relief.

Breaking ice—That December was the coldest on record: 21 days of below-zero temperatures. We loaded the wall insulation, flooring, paneling, trim and whatever tools and equipment we could think of (including heaters and enough propane for the winter) on the scow for one last boat trip to the island. On Dec. 14 and 15, we broke 7 miles of 2-in. to 3-in. thick ice in temperatures ranging from -4 F to -17 F. The balance of the millwork and other materials would be delivered later by snowmobile and sled when the ice cover was thick and sound.

Thin walls—Before freeze-up, we had managed to start framing exterior wall panels to fit between the bents. Now it was time to complete the walls and get some heat inside the house.

We framed both the exterior and interior walls with 2x3s to allow the wall posts to be exposed. The exterior walls are insulated with 2½-in. thick fiberglass batts (sufficient for a three-season house), covered on the inside with a 6-mil polyethylene vapor barrier and covered on the outside with ½-in. plywood sheathing and then with Tyvek house wrap.

The spaces between the bents were sized both vertically and horizontally to accommodate the Andersen windows. The doors, however, were another matter. The larger mill houses were not interested in making special doors for us. We were fortunate enough to have the Croghan Island Mill nearby (Bridge St., Croghan, N. Y. 13327; 315-346-1115), an heirloom that is still running on water power. They made all of the exterior and interior door units to our dimensions at very reasonable prices.

With the walls roughed in, our finish carpenters applied 1x6 T&G white-pine paneling to the interior of the house and 1x6 T&G Western red-cedar siding to the exterior. The only exterior trim on the house is cedar boards milled to match the bent posts and nailed to the exterior siding directly over the hidden posts. This again reinforced the module. The soffit is finished with 1x6 white pine and continues from the exterior to the interior to provide a visual link between the outdoors and the indoors.

Back on top—Once the ice melted in early April, we resumed work on the roof. We removed the tarps, applied furring strips horizontally 5 in. o. c. over the felt and topped the roof with Western red-cedar shingles nailed to the furring. The valleys and gables were flashed with terne-coated stainless-steel flashing (TCS) made by the Follansbee Steel Corporation (P. O. Box 610, Follansbee, W. Va. 26037; 800-624-6906). This material is as workable as copper, but it doesn't leach and stain shingles like copper does. Its color, almost like pewter, blends well with weathered shingles. At this time, we also installed a custom-made, chimney-cricket skylight over the living room (see sidebar facing page) and two Pella skylights, one over each bathroom (top photo, p. 73).

Linear lighting—Meantime, the finishing crew laid fir flooring throughout the house, built pine cabinets for the kitchen and bathrooms and prepared the tops of the interior soffits to accommodate cove lighting (bottom photo, p. 73).

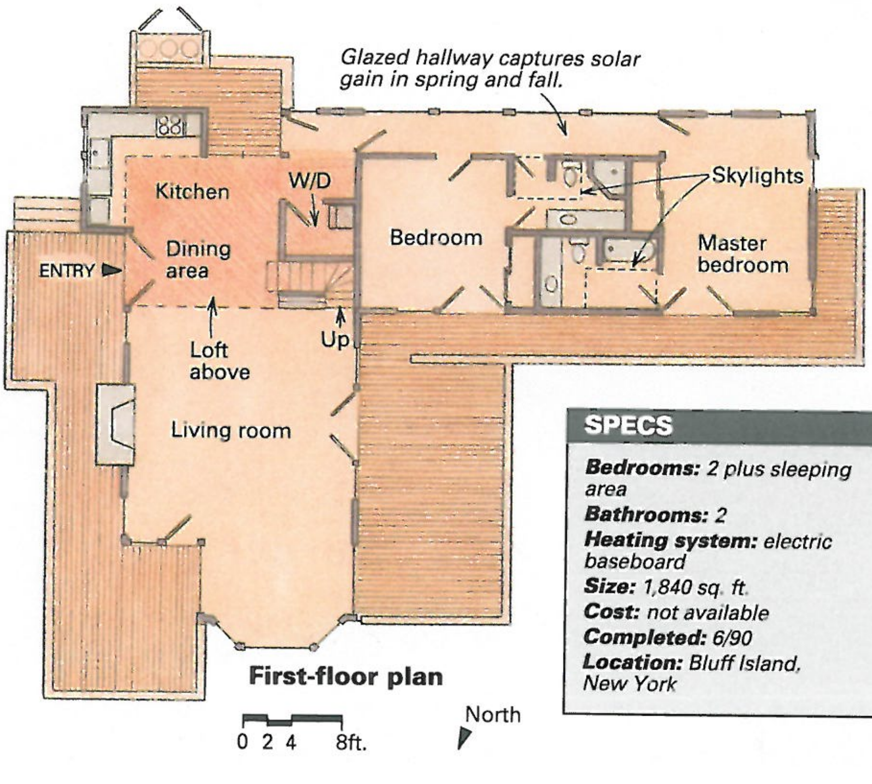
We choose ALKCO linear incandescent lighting fixtures for the cove lighting (ALKCO, Div. of Jac Jacobsen Industies, Inc., 11500 West Melros Ave., Franklin Park, Il. 60131; 708-451-0700). Th dimmable lighting is considerably more expe sive than fluorescent lighting (a 12-in. long fi ture costs almost $40), but it's also considerabl nicer. The light is warm, soft and continuous (th bulbs butt together tightly, unlike fluorescer bulbs), and the fixtures are much quieter tha dimmable fluorescent fixtures.

Odds and ends—By late spring, the house wa close to completion. The outside crew laid th decking and built cedar railings. The railing post were laid out on the module to reflect the struc tural layout of the building. We designed th balustrade with an open slot at the top for eas viewing of the river below.

Augliano Painting of Clayton, N. Y., finished th siding and deck railings with Cabot's Bleachin Stain and the soffit with Clear Wood Finish, o CWF, made by The Flood Company. Inside, the applied clear finishes only: Watco Danish Oil o the wall paneling, ceiling, bents and cabinetry and polyurethane on the flooring. Doors wer finished with Pratt & Lambert Solid Hide Oi Stain, in a color matching the "Terratone" colo of the Andersen windows.

Landscaping was kept to a minimum. We di some planting and seeding to cover our track and to give back to nature some of what we ha taken. We planted native flora only: cedar, pine maple, birch and juniper. A wet spring made thi somewhat difficult. Bud Constance, who sowe the seeds, was thinking on his feet, however. H wore snowshoes so he wouldn't sink up to hi knees in soggy soil. □

Steve Taylor is a designer/builder in Thousand Island Park, N. Y. Photos by Bruce Greenlaw.



First-floor plan

SPECS

Bedrooms: *2 plus sleeping area*
Bathrooms: *2*
Heating system: *electric baseboard*
Size: *1,840 sq. ft.*
Cost: *not available*
Completed: *6/90*
Location: *Bluff Island, New York*

We have found that a house is most successful when it is designed with an appreciation for the land itself, along with an understanding of people's values, needs and wants. The home then becomes a sanctuary for the spirit.

Built amid the great northern beauty of the Thousand Islands, this house is a pavilion in "The Garden of the Great Spirit," a friendly and protective place from which to observe and reflect upon nature's power and glory. Our challenge was to do this gracefully and in harmony with the natural surroundings.

-Steve Taylor

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