



A Steel Home on Wood

BY BRIAN COURT, AIA AND JEFF PRIBYL, P.E., S.E.

Photos by Ranquist Development



This page: Three views of the main floor with the main steel moment frame running the length of the house.

Wood Flooring by: Rode Brothers Chicago

BOB RANQUIST HAS BEEN BUILDING ultra modern single family homes and multi-unit condominiums in Chicago for the last decade. The client for this new residence in the city's Bucktown neighborhood had lived in a Ranquist house for many years. Once he married and decided to have a family the need arose for a larger house. He went back to Ranquist for a new house. Ranquist brought on Miller | Hull, Seattle, as the design architect and Osterhaus McCarthy, Chicago, as the architect of record. The team had just finished a 10-unit condominium in the same neighborhood.

Miller | Hull conceived of the house as a series of boxes containing the private family spaces (bedrooms and baths) on the upper level floating over an open, free-flowing main level with the shared family spaces. The main floor is a series of stepped planes, lifted up above a partial basement, that incrementally steps up and bridges over the rear yard to a roof deck above the garage. A daylighted basement contains guest rooms, theater, storage spaces, mechanical/electrical and play spaces for the children.

Structural System

The long narrow site measures 33 ft wide and 125 ft long and the desire for an open plan did not allow for transverse shear walls. Long spans and large openings and cantilevered volumes would have exceeded the capabilities of a wood frame. A hybrid system of

steel primary members and wood secondary members proved to be the ideal design solution. Ranquist's previous residential work had been almost exclusively based on a structural system of masonry block and wood frame with open web trusses and initially there was skepticism about the added cost of the steel frame for a project of this size. Fortunately the steel estimates came in on budget and we were off and running.

The structural approach to the house was simply to use materials in appropriate ways—concrete and masonry where the building touches the earth, steel for height and span, and light wood frame everywhere else. A central spine of steel columns runs the length of the house supporting the upper floor bedrooms. The second floor is held back 4 ft along the north side of the building allowing a continuous skylight the length of the house that brings an abundant amount of natural light to the main floor spaces.

Structural Expression

One of the primary design philosophies at Miller | Hull has long been to express the structure of building to help define the space and bring a level of richness and articulation to a building. Using the essential elements of a building to bring character and interest frees the architect of the obligation to apply expensive finishes and decoration. Fortunately, one the homeowners previously had lived

Conceived with a spine of steel, this urban residence offers open spaces and lots of light.



The Miller|Hull Partnership

A steel spine enabled the creation of this spacious and open urban residence on a long, narrow site.

in converted loft spaces in New York and had developed an affinity for the industrial feel and scale of these spaces.

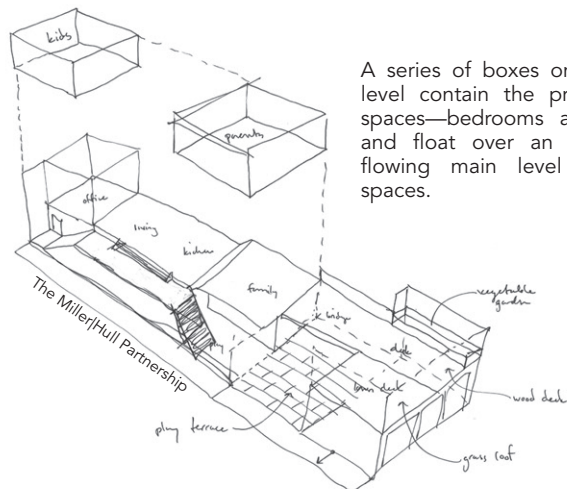
The design of this home sought to express as much of the steel and connections as possible. A good example of this is location of the splice plates on the three-story steel frame that supports the roof monitor. Instead of hiding them or locating them in an out-of-sight location, they instead were placed in a visually prominent location, right at the second story bridge.

To minimize thermal transfer issues the steel columns are inset from exterior walls and beams cantilever as required. Not only does this design detail improve the building performance, it also brings a heightened awareness of structure.

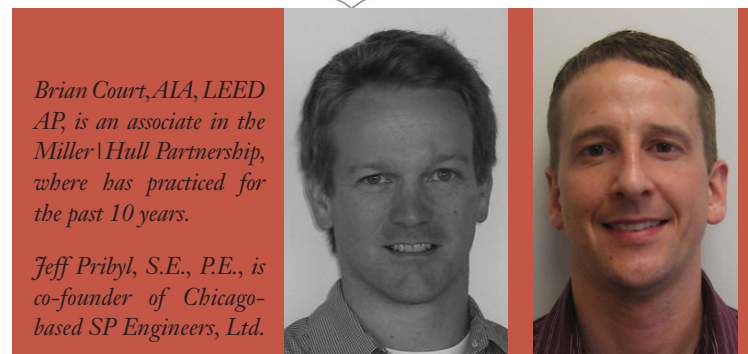
Load Resistance

The lateral load resisting system of the building consists of steel moment frames, cantilevered columns, concrete masonry unit (CMU) shear walls and plywood shear walls. Three steel moment frames consisting of W8 columns and W14 beams span the short direction of the building to provide stability up to the second floor level. A single story CMU wall provides additional stiffness at the front of the house.

Because the building steps back approximately 4 ft along the north wall at the second floor, the steel frames could not continue



A series of boxes on the upper level contain the private family spaces—bedrooms and baths—and float over an open, free-flowing main level of shared spaces.



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