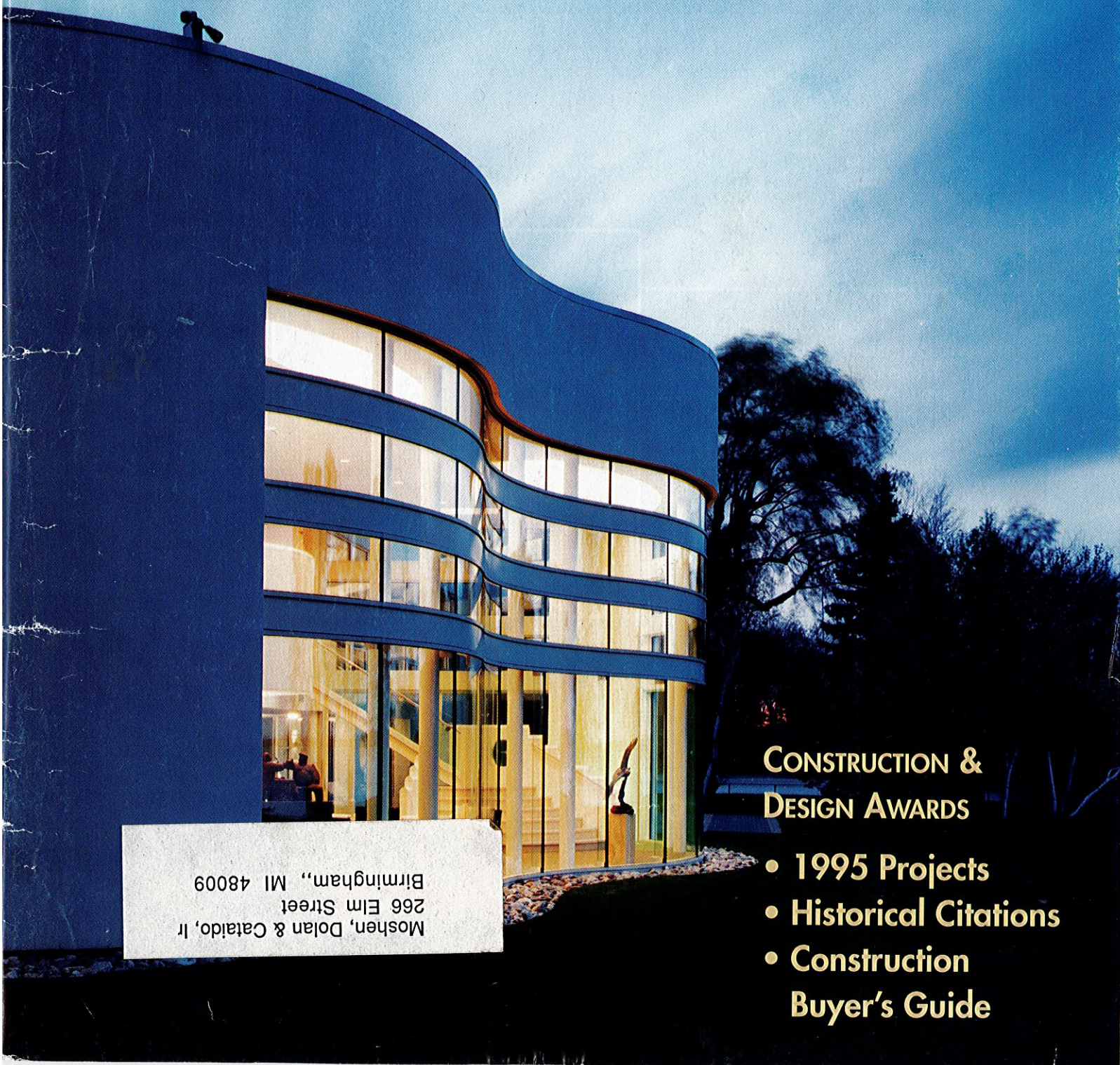




THE ENGINEERING SOCIETY 1895-1995
A CENTURY OF ACHIEVEMENT
A NEW MILLENNIUM OF DISCOVERY

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TECHNOLOGY



Moshen, Dolan & Cataldo, Jr
266 Elm Street
Birmingham,, MI 48009

CONSTRUCTION & DESIGN AWARDS

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SHIP SHAPE

— BLENDING LAND & WATER; VESSEL & DOMICILE —

Property: Brooks Residence
Orchard Lake, Michigan
Owners: Ernie and Kileen Brooks
Architect/Designer: Kenneth Neumann/Joel Smith
and Associates, Inc.
Contractor: Mosher, Dolan & Cataldo, Inc.

LAND USE/ENVIRONMENTAL CONSIDERATIONS

The site for the new residence was unusual in that more than half of its perimeter was bounded by water. The irregular three-acre site terminated a cul-de-sac off a main drive in the lakes area of southern Oakland County. The property sits along the southerly edge of a large lake, but was also connected by a narrow channel to a secondary lake of 10 acres. A portion of the property exhibited characteristics of many lakefront sites in that the water table was high and soil types were largely peat and marl, not appropriate for normal foundations. Midway through the site, the topography changes, creating a steep slope upwards to the plateau of the entrance elevation.

The two non-water sides of the site were densely wooded with both deciduous and ever green growth, trees as tall as 80-100

The design of the house places soft curved forms in contrast to crisp rectangular forms. All glass components were created with a singular radius to allow for ease in construction, reductions in cost, and ease in replacement, if required. To contrast with the weighty appearance of the brick, synthetic plaster was used over the large expanses of glass to the rear.

To "do away with walls" and use continuous glass to capture the views, the front and rear of the house are supported by pairs of steel columns — a methodology unusual in housing.

Reflecting the owners' affinity for a water recreation lifestyle, the design concept capitalized on the site's relationship to water by alluding to the house as a ship.

feet. Because of this foliage, no nearby residences can be seen from anyplace on the property. The closest residence that can be seen is located two miles away across the major lake.

The entire focus of the house was to take advantage of the lake views. Further, the design team was determined to remove the least number of existing trees in order to contrast what man has made juxtaposed against nature.

Extensive geotechnical investigations were made of the site to determine how close the house could be built to the lake. Investigations showed that if the house were to be built anywhere within the flat zone near the water, that the house would require deep pile foundations, of approximately 40 feet. Over 30 borings were developed to create a line where good soil met bad, hence locating the structure.

Additionally, the owner had been informed that a sanitary sewer would be built before the house was completed. During construction, the designers became aware of the fact that sewer construction had not commenced and therefore, the house was developed with a septic system that could be disconnected as the sewer line was completed.

The completed design concept develops a private road with a turnaround creating an entrance court for

the new house. On the right is the garage, on the left a landscaped transition ingrade to the lower plateau, and before the visitor the front facade of the house encapsulated in glass block.

APPROPRIATENESS OF MATERIALS

The majority of the residence has been sheathed in white painted brick. Brick was selected for its ability to be used in wall bearing applications, for its look of strength, and for its familiarity. The bricks' size and texture give it a residential feel, but in the case of this house, allow the designer to create the variety of large and small radius curves.

The design of the house places soft curved forms in contrast to crisp rectangular forms. This contrast is seen when looking at the structure from any direction. The front facade of the house was created to allow abundant quantities of light to enter without a loss of privacy to the residents. The glass block front wall uses three glass block types. Near the entry smooth transparent block was used to allow the residents to see their friends as they enter up the auto court. In the areas where bathrooms are placed behind the glass block wall, a block is used that incorporates a translucent fabric liner. In all other locations, a rippled clear glass block is used. The three types have been orchestrated into an abstract pattern which shimmers at night due to varying levels of translu-

cency.

In the rear of the house, it was appropriate to create large glass surfaces. To replicate the curved quality of the front glass block wall, curved glass was used to the rear. In order to deal with windloading on the two-story wall, butt-glazed twin-pane glass was used in narrow bands at the top of the room, whereas large twin-paned elements with glass stabilizers were used at the bottom for unobstructed views. All glass components were created with a singular radius to allow for ease in construction, reductions in cost, and ease in replacement, if required.

To contrast with the weighty appearance of the brick, synthetic plaster was used over the large expanses of glass to the rear.

QUALITY OF OVERALL DESIGN

Together owner and architect imagined the dwelling as a beached liner moored to the land. From this idea, the following ideas generated. curved forms common to ships in the form of hulls or sails; exposed steel structures common to ships; white, as a common color for ships; portholes, as a common method for view and ventilation; a bridge, common to all ships; smokestacks, to eliminate combustibles; and gangplanks, for transition from level to level. Each of these devices was abstracted and made a part of the house.

To express the idea of a beached ship more strongly, it was important to create a structure clearly man-made and different from nature. The white color strongly sets the house apart against the dense trees and green lawns. The geometric forms of the house are a perfect foil for the randomness of the natural setting around the structure.

The interior of the house is organized by a singular long narrow rectangular box sitting amidst a curved front and rear form. This rectangular element is framed in steel columns, floored with wood, exhibits a promenade deck along

each side and encapsulates a number of distinct rooms between, den and kitchen. From each promenade, prominent views to the outside and to the water occur, again reinforcing the idea of house as ship. Lastly, the interior is bathed in light, from the roofs through skylights, as well as through the walls. A major skylight splits the house and focuses on the dock and boats at the water's edge.

The rooms encapsulated within the promenades have no opaque walls to the ceiling. Either open or sheathed in glass, this design device gives the feeling of a roof that totally floats. The den roof, round in shape, punches through the main roof form and becomes a clerestory bridgelike element. To further the ship analogy, the chimneys from bedroom and living room bracket the bridge, are sheathed in round resinous cement forms and are considerably taller than required for residential chimneys.

UNIQUE ENGINEERING SYSTEMS

Most residential construction is generated from the use of all wood structural members and the concept of windows as a hole in a solid surface. A traditional builder will make walls and then in size windows of varying shapes in the wall, but the wall will still prevail as mostly solid. For this house, it was important to do away with the conventional concept of a wall and use continuous glass surfaces to capture the views. Therefore the front and rear surfaces of the house are supported by pairs of round vertical steel columns. Although not unique in the world of engineering, this methodology is unusual in housing. With few exceptions, the majority of the floor and roof components are built of wood.

In order to accomplish the

wide expanses of glass without interruption to view, glass stabilizers 3/4" wide by 8" deep were used in lieu of metal or wood. All glass components were attached by the use of structural silicone.

Due to the large expanses of glass, roof-mounted air conditioning units have been used to supplement more traditional heating/cooling units in the basement. These components have been encapsulated in round metal shields that give the appearance of bridge elements as seen in ships.

Lastly, the entire house has been created electrically as a "smart" house. All electrical building systems including security, sound, communications, and lighting are computer-integrated allowing the owners to operate any of the systems in any room of the house.

DEGREE OF ENERGY CONSCIOUSNESS

The entire envelope of the house has been insulated to meet or exceed governmental standards regarding energy consumption. The majority of the lower floor is earth-insulated in that three-quarters of its perimeter are set into the existing hill. All glazing is 1 inch doubleglazed. Solid building components provide insulation by either batt or rigid components. The structure is zoned by the use of four standard heating and air conditioning units, two for the lower level and two for the upper, sized appropriate to areas and volumes of space served. Additional cooling units have been placed on the roof to assist in dealing with heat gain in the large public spaces.



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The home's design included curved forms common to ships in the form of hulls or sails; exposed steel structures; white, as a common color for ships; portholes; a bridge; smokestacks; and gangplanks, for transition from level to level.