BY CRAIG ELLWOOD
This house, the last of a series of three that Craig Ellwood has designed for our continuing Case Study House Program, is certain to provoke new thinking and new construction techniques in the residential field.

For some time it has been Ellwood's contention that the increasing cost of labor and the decline of the craftsman will within not too many years force a complete mechanization of residential construction methods. All houses, except those with very high budgets, will someday be constructed of factory-built components designed for fast and easy site assembly.

Unlike the typical pre-fab, where the designer and the manufacturer believe it a requisite to copy past and current styles and where a supreme effort is made to make the product appear to be job built, no attempt to disguise has been made here. The architecture of this house is based upon the system utilized and the visual organization properly reflects this system. The elements of the system are strongly defined with color: ceiling and panels are off-white and the steel framework is blue. Since room partitions occur on module or mid-module, there is unity between structure and plan and structure and form. The color-defined frame thus provides a visual rhythm which emphasizes this unity.

The plan is oriented to the site for best advantage of southern exposure and the view of city lights, the coastline and distant hills. For ample off-street parking, a large paved motor court was provided. Landscaping was designed to supplement and complement the existing natives already growing on the site. The complete landscaping was described in February 1958 ARTS & ARCHITECTURE.

Past and present pre-fab panel houses actually produced integrate structure with panel, i.e., the panel itself is designed and constructed to carry vertical loads and resist the lateral forces of earthquake and wind. Since panels are structural, they are heavy and difficult to handle, and panel connections, designed to transfer structural forces, are by necessity complicated and costly.

This house differs in the fact that the structure and panel are separated. Each, however, is pre-fabricated. In the development of an ideal pre-fab system it seemed logical, considering the earthquake factor here in California, to use a modular structural frame.
and to make this frame do all the work, thus greatly simplifying structure and structural connections. Further, a segregation of structure from walls provided a design flexibility not otherwise possible by setting no limitation as to selection of wall material. Metal, wood, plastic, ceramics or glass panels may be used, each with equal ease.

This house utilizes a steel structural system of shop-fabricated 16-foot "bents" of 2" square tube columns, 2"x5½" rectangular tube beams. These "bents," units of beams and columns, were erected by 4 men in 8 hours. Job welding was limited to 19 beam connections, 40 column base plate connections.

Square and rectangular steel tubing are relatively new structural forms. These sections were selected because they seemed to be best suited to detail and connection simplification and standardization. One detail, one connection method, serves all exterior wall conditions: glass, panels, sash and sliding glass wall units attach to the frame in the same manner. This connection and others were described in detail with photographs of actual components in March 1958 ARTS & ARCHITECTURE.

Steel was selected for the frame for several reasons. Its relative newness, its latent potential in residential construction, its strength/weight, strength/size ratios, its permanence, its crisp fine line were all governing factors. Also of major importance is the fact that moment-resisting structural connections in steel are simple. A steel column can easily be fixed at the base to resist rotation. A wood post resisting the same forces as the 2" square tube would possibly have to be 9 to 12 times larger in section and because of the nature of the material, base connections would be costly and complex. With smaller wood members, the structural frame could no longer do the work and shear walls—walls designed to withstand lateral forces—would be required thereby complicating the system.

The Fenestra roof decking is 18 gage steel building panel welded to the beams. These high-strength panels span 8 feet. The interlocking side laps and telescoping end laps of these panels allowed quick, easy and neat installation. The roof is insulated with Celotex pressealed 1" thick rigid fibreboard. Over this was applied a 4-layer built-up Pabco roof of 15# asphalt saturated felts surfaced with crushed slag.

Steel was also used for the piling foundation. The site consisted of uncompacted fill varying in depth from 8 feet to 41 feet. Twenty-two 10"-WF-42 # steel piling, totaling almost 600 linear feet, were power-driven to depths from 9 feet to 52 feet and to a minimum bearing value of 35 tons per pile. Reinforced concrete girders on a 16-foot grid span between piling below grade and the 7" thick reinforced concrete floor slab spans between girders. A complete report of the foundation problem was featured in August 1957 ARTS & ARCHITECTURE.

The pre-fab wall panels are constructed of Harborite 9/32" thick marine plywood, plastic-faced with resin-impregnated overlays to prevent grain-raise, checking and delamination. These panels are glued and nailed to 1½" x 2" (net) Douglas fir framing. Some of the interior panels are faced with ¼" thick ribbon grain Philippine mahogany plywood. All wall panels, interior and exterior, are acoustically and thermally insulated with Celotex mineral wool batts.

All rooms open to the pool terrace and view garden with Steelbilt steel-framed sliding glass walls except the two small bedrooms. Sliding glass walls open these two rooms to a private court enclosed with pre-fab panels set in steel frames. In all, 12 8'x8' sliding glass wall units are used. For privacy, no clear glass walls face the street or motor court.

Flooring throughout, except in carpeted areas, is brick size 8'x4' quarry tile and small square ceramic mosaics. The steel-framed fireplace and the wall over the kitchen cooking tops are also faced with quarry tile. Bath walls and floors and all countertops are ceramic mosaics. The quarry tile is beige, carpeting is off-white wool loop pile. Each bath and the kitchen countertops feature different color schemes of the ceramic mosaics. Also constructed of chipped and crushed ceramics is the 8'x8' mosaic mural in the covered court which is adjacent to living, dining and breakfast areas. This subtly and effectively repeats colors used in the house and landscaping. All tile is from the Mosaic Tile Company.

Aluminum-framed Wasco plastic dome skylights are used throughout the house to provide natural lighting in halls, baths and dressing
areas. To filter the sun, blue heat-absorbing wireglass is used in steel-framed canopies over all glazed walls. This glass is also used in a puttyless aluminum-framed 8' x 16' skylight over the livingdining court. At night these glazed canopies and the skylight become huge light fixtures emitting a soft blue illumination; through the use of exterior floodlighting directed onto the glass from above. Translucent glass is also used in the screen walls adjacent to carport and entry and in the low steel-framed space divider partition between entry and dining areas.

Interior lighting was designed to properly illuminate the client's art collection and to provide general illumination as requested, with quietly dramatic accents. All light switches are the new silent rotating type that glow in the dark. All fixtures are from Holliday Lighting Company. The hi-fi system from Altec Lansing, located in the music room cabinet, includes AM-FM tuner, automatic 3-speed record player, and high and low frequency speakers. Additional speakers are located in the master bedroom and the living-dining court. The system may be remotely controlled from the master bedroom bed headboard cabinet. Also remotely controlled from the headboard is a built-in TV set which is located behind a flush wall panel on the wall opposite the bed. Provisions are also made for future built-in color TV below the speaker panel in the music room hi-fi cabinet. There are additional TV outlets throughout the house and garden courts for use with portable TV sets.

The built-in radio-intercom system from G and M Equipment Company provides instant communication between the master control station in the kitchen and the remote speakers in all bedrooms. Additionally, this system provides radio reception at any or all stations, two-way auto-electronic sound “squelch” which interrupts and transmits a baby's cry or unusual noise, a fire warning device and alarm which operates from any and all stations, and the protective, walk-saving entry door substations which allow identification without opening the door.

The push-buttons at entry doors activate chimes in three recessed built-in “chime-clocks” at various locations within the house. All kitchen-utility appliances from Westinghouse are built-in. There are three two-burner cooking tops, two ovens (one with rotisserie attachments), two refrigerator-freezer units, dishwasher, garbage disposer and “stacking” automatic washing machine and dryer. All appliances are stainless steel except the washing machine, dryer and disposer. The built-in NuTone food center unit provides attachment for mixer, blender, juicer, meat grinder and knife sharpener. A twin blower type ventilating fan is ceiling-cessed over the cooking tops. Additional vent fans are used in each bathroom.

The vacuum cleaning system is also built in. The power unit with tank is located in the storage compartment adjacent to the carport, thus noise, dust and electric cords within the house are eliminated. The aluminum duct system is under the floor slab and there are six inlets located throughout the house. One hose with its attachments allows the easy, noiseless cleaning of floors, walls, fireplace and fabrics and the large capacity tank simplifies the emptying problem.

The 8-foot Philippine mahogany slab doors and all cabinet work and natural wood wall paneling, also Philippine mahogany, are from U. S. Plywood. Special cabinets include the combination coat closetmusic center cabinet in the music room, the combination storage-bar in the dining area, the recessed buffet-storage unit also in the dining area, and the desk in the master bedroom. The bar cabinet includes stainless steel sink, single lever control faucet, refrigerator and storage for liquor, glassware and accessories. Both the bar counter with “splash” and the master bedroom desk are faced with plastic laminate. Wardrobe units are of pre-fabricated metal-framed top-roller sliding hardboard panels. Each of the smaller bedrooms has 12 linear feet of wardrobe, the master bedroom dressing areas has a total of 32 linear feet. Pin type hinges are used on all swinging cabinet doors. Latches are both magnetic and “touch” type.

The house, located at 1129 Miradero Road, Beverly Hills, California, is open for public showing, Saturdays and Sundays, from 1 to 5 p.m. through June 29, 1958.
Florette Fields, Muralist
Dining-room table is manufactured by Brown Saltman, dining chairs by Herman Miller; all garden furniture is by Van Keppel-Green except the Herman Miller chair near the mural; garden pots are by Architectural Pottery; quarry tile flooring and ceramic mosaic floors, bathroom walls, mural tile and countertops are by the Mosaic Tile Company; built-in kitchen appliances are by Westinghouse; all lighting is from Holliday Lighting Company.

All Photographs by Marvin Rand
Upholstery and drapery fabrics by L. Anton Maix Fabrics, Inc.;
Bookshelf hardware is from Stax Company
PRODUCTS CASE STUDY HOUSE NUMBER 18

THE FOLLOWING PRODUCTS WERE MERIT SPECIFIED BY CRAIG ELLWOOD ASSOCIATES:

STRUCTURAL
Steel Piling — Columbia-Geneva Steel Division, United States Steel Corporation, 120 Montgomery Street, San Francisco 6, California
Structural Steel Tubing — Baker Steel and Tube Company, 1540 Caloma, Los Angeles, California. Steel produced in the mills of National Tube, Division of United States Steel Corporation
Steel Roof Decking — Walter R. Steyer Company, 6424 Bondini Boulevard, Los Angeles, California. Manufacturer: Fenestra, Inc., 2250 East Grand Boulevard, Detroit, Michigan
Cement — Portland Cement Association
Roofing — Fibo Products, Inc., San Francisco, California
Insulation — Celotex Corporation, 120 South LaSalle Street, Chicago 3, Illinois
Plastic Skylights — Wasios Products, Inc., 9163 Fairview Avenue, San Gabriel, California
Glazed Skylights — Alumina, Inc., 2993 Allesandro Street, Los Angeles, California
Translucent Glass — Mississippi Glass Company, 88 Angelica Street, St. Louis, Missouri
Douglas Fir Framing Lumber — West Coast Lumbermen’s Association, 1410 S.W. Morrison Street, Portland 5, Oregon

FINISHES
"Harborite" Plastic-Faced Marine Plywood — Harbor Plywood Corporation, 235 South Alameda Street, Los Angeles, California
Cabinet and Wall Panel Philippine Mahogany Plywood — United States Plywood Corporation, 4480 Pacific Boulevard, Los Angeles, California
Quarry Tile and Ceramic Mosaic Tile — The Mosaic Tile Company, 829 North Highland Avenue, Hollywood 38, California
"Permatex" Plastic Laminates — Formica Corporation, 4605 Spring Grove, Cincinnati 32, Ohio
Asphalt Tile — Pioneer Division, The Flintkote Company, 55th & Alameda Streets, Los Angeles 54, California

ELECTRICAL
Electric Switches and Devices — P & S Depard, Pass & Seymour, Inc., Syracuse, New York
Telephone Outlets, Conduct Provisions — Architects & Builders Service, Pacific Telephone & Telegraph Company, 740 South Olive Street, Los Angeles 55, California
Chime Clocks, Push Buttons and Bath Ceiling Heaters — NuTone, Inc., 237 West 30th Street, Los Angeles 1, California

FIXTURES
Plumbing Fixtures (Except Kitchen & Bar Sinks) — Briggs Manufacturing Company, Detroit 26, Michigan
Kitchens & Bar Sinks — Ziegler-Harrington, 2900 North San Fernando Road, Burbank, California
All Valves (Except Lavatory) — Moen Valve Company, Division of Ravenna Metal Products Company, 6518 Ravenna Avenue, Seattle 5, Washington
Lavatory Valves — Briggs Manufacturing Company, Detroit 26, Michigan
Shower Heads — Speakman Company, Wilmington 99, Delaware
Ventilating Fans — NuTone, Inc., 237 West 30th Street, Los Angeles 1, California
Door Intercom — Kwasket Sales & Service, Anaheim, California
Cabinet Hardware — Washington Steel Products, 1940 East 11th Street, Tacoma 2, Washington
Book Shelf Hardware — Stan Company, 390 9th Street, San Francisco 3, California

LIGHTING
All Lighting Fixtures — Holliday Lighting Company, 1633 South La Cienega Boulevard, Los Angeles 15, California

DOORS & SASH
Steelframed Sliding Glass Doors — Steelbilt Sales Company, 18001 South Figueroa Street, Gardena, California
Sliding Wardrobe Doors — Woodall, Inc., 801 West Valley Boulevard, El Monte, California
Stab Doors — United States Plywood Corporation, 4480 Pacific Boulevard, Los Angeles, California
Tub Enclosures — American Shower Door, Inc., 936 North Cahuenga Boulevard, Hollywood 38, California
Jalousie Sash — Cal-State Louvre Manufacturing Company, 2464 Fletcher Drive, Los Angeles 39, California

APPLIANCES
Built-In Appliances (2 Burner Cooking Tops, 2 Refrigerators/Freezers, 2 Ovens, Washing Machine, Dryer, Dishwasher, Garbage Disposer) — Westinghouse Electric Supply Company, Mansfield, Ohio
Built-In "Food Center" (Mixe, Juicer, Blender, Meat Grinder, Knife Sharpener) — NuTone, Inc., 237 West 30th Street, Los Angeles 1, California
Built-In Vacuum Cleaner — Central Vacuum Corporation, 1206 South Maple Avenue, Los Angeles 15, California

FURNISHINGS, DRAPERIES & CARPETING
All Furniture (Except Garden Furniture, Dining Table and Beds) — Dealer: Carroll Sagar & Associates, 8833 Beverly Boulevard, Los Angeles, California
Manufacturers: Herman Miller Furniture Company, Zeland, Michigan
Garden Furniture — Van Keppel-Green, 116 South Losky Drive, Beverly Hills, California
Dining Table — Brown-Saltman, 2570 Twentieth Boulevard, South Gate, California
Bed and Headboard — Craig Ellwood Associates
All Upholstery and Drapery Fabrics — L. Anton Maix Fabrics, Inc., 162 East 59th Street, New York 22, New York
Carpeting — Axton Floor Covering, Inc., 9006 Metrose Avenue, Los Angeles, California

HI-FI & INTERCOM
Hi-Fi Components — Manufacturer: Bose Lansing Corporation, 6920 McKinley Avenue, Los Angeles, California. Dealer: Gilbert J. Gilbert Company, 4030 Jill Place, Encino, California

GARDEN
Swimming Pool — Datken Pools, Inc., 16625 Ventura Boulevard, Encino, California
Automatic Sprinkler Control — Larro, Inc., 2409 San Fernando Road, Los Angeles 63, California
Garden Pots — Architectural Pottery, Box 24664, Village Station, Los Angeles 24, California