" Rarely does low-income housing **push the limits** of architecture or structural engineering, yet this one did. "
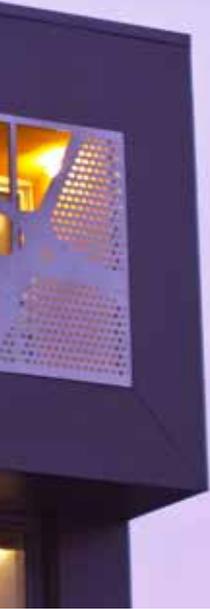
—Jacob Schueller

**SIERRA BONITA MIXED-USE AFFORDABLE HOUSING, WEST HOLLYWOOD, CALIF.**

Sierra Bonita is a 50,000-sq.-ft, five-story, mixed-use, affordable housing structure located in West Hollywood, Calif. Commissioned by the non-profit West Hollywood Community Housing Corporation (WHCHC), the building is the pilot project for the city's Green Building Ordinance—a local alternative to LEED and one of the first programs of its kind in the nation.

There is parking at the basement and ground-floor levels, and the ground floor also provides space for WHCHC and other non-profit groups such as AIDS Project Los Angeles. The building's 42 one-bedroom apartments are set aside for low-income residents with special needs, including the elderly, disabled and those diagnosed with HIV/AIDS.

The perimeter columns of this 112-ft by 100-ft building are spaced at 20 ft. To allow for its various uses, the building was designed with only four interior columns from the ground floor up. At the courtyard, floor beams connect to 60-ft-long girders, which carry the forces back to columns at the corners.

Zoning restrictions limited the building height to a maximum of 50 ft. Typical apartment floor slabs are 1½-in. metal deck with 4½-in. normal weight concrete slabs which span 20 ft and work compositely with the W24 steel beams. These beams are cambered and span 43 ft, from the courtyard to the perimeter walls, and the slab has extra reinforcing to allow the steel beams to align with partitions between units, resulting in apartments with higher ceilings. The deck was shored to control deflections under the wet weight of the concrete. The roof framing is lighter as the deck supports no concrete, minimizing seismic loads and material use.

The ground- and second-floor slabs are more traditional 3-in. metal deck with 3½-in. normal weight concrete slabs spanning up to 11 ft to composite beams and girders. The second floor supports an outdoor bamboo garden and apartments while the ground level includes offices, retail spaces and parking.

In a sector that is accustomed to cutting corners and settling for boiler-plate design, Sierra Bonita successfully integrates affordability, sustainability and style. This integration is most apparent in some of the building's visually striking elements such as the courtyard's eccentric pink fiberglass wall.

The wall at the entrance of the courtyard resembles a series of intersecting shards and is in fact based off of the eccentrically braced steel frame. This frame forms a component of the lateral resistance system in the north-south direction. It uses a variety of wide-flange beams and tube steel bracing to adequately express the randomness desired for the architecture.

In addition to the eccentrically braced frame, for north-south stability a concentrically braced frame runs along the east façade, while two segments of a concentrically braced frame run along the west façade. The concentrically braced frames are comprised of W16 beams, W12 columns and HSS braces ranging in size from 6×6 to 12×8.

For east-west stability, moment frames along the north and south faces of the building utilize W18 girders spanning 20 ft to the strong axis of W14 columns.

Canopies, framed with HSS, at the roof cantilever out and down past the north façade to support photovoltaic panels, which provide energy for the building. Recycled steel is used throughout the project, and steel framing with long-span deck is used to accommodate the parking grid below and to minimize floor-to-floor heights.

**Owner**
West Hollywood Community Housing
  Corporation, West Hollywood, Calif.

**Architect**
Tighe Architecture, Santa Monica,
  Calif.

**Structural Engineer**
Gilsanz Murray Steficek, New York

**General Contractor**
Parker/Sarg Industries, Pasadena, Calif.

**Consultant**
Castle and Gray International, Inc.,
  Malibu, Calif.

**Photographs**
Art Gray Photography