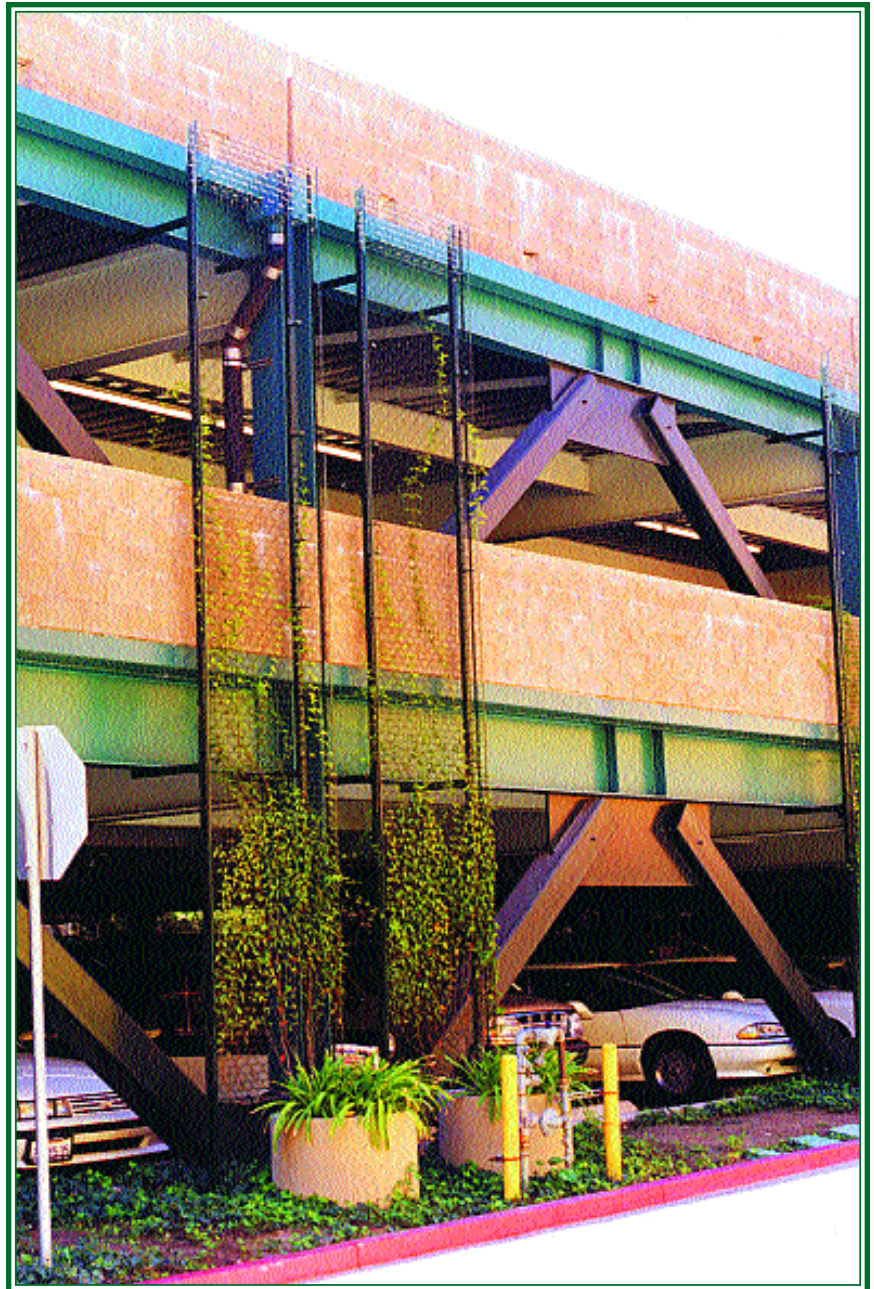


In order to rebuild a severely damaged parking structure in time for the Christmas shopping season, the project team turned to a steel design



REBUILDING AFTER NORTHRIDGE

By Scott Kennedy, P. Eng.

WHEN SAUL McCORMACK, OPERATIONS MANAGER FOR THE FASHION SQUARE RETAIL CENTER in Sherman Oaks, CA, ventured out to the site after the Northridge Earthquake in January 1994, he discovered that the main shopping center structure was intact, with some localized connection failures and heavily damaged interiors. However, the center's two concrete garages were far more seriously damaged—with at least one obviously beyond repair.



The parking structure design is simple, though attractive. It features concentric bracing for lateral stability, hollow structural section columns for aesthetic appeal and wide flange beams.

Almost immediately, Allan Lynn and Dave Berger, who represented the center's then owner, City Freeholds (PTY) Ltd., traveled from Sydney, Australia, to survey the damage. Also, Frederic Wilhem of A.N.F. & Associates, El Monte, CA, was hired as structural engineer-of-record to assess the damage and make repairs. Initially, it was assumed that the heavily damaged concrete parking would be replaced with a similar concrete structure. However, Wilhelm





instead suggested that Scott Kennedy from Kensco Engineering Ltd. in West Vancouver, Canada, be contacted to evaluate the feasibility of a steel alternative.

The steel proposal that began as a casual inquiry soon became the obvious choice as a structural system. With steel, a November opening to coincide with the beginning of the Christmas shopping rush was possible. In contrast, the concrete proposals were expected to take from 13 to 18 months—eliminating the possibility of a Christmas opening. With steel on-site construction, delays and risks were minimized and costs were very comparable. In addition,

a planned future third level also could be more easily accommodated in a steel structure. Within a week of the beginning of discussions, a preliminary steel layout was prepared by A.N.F. and Kensco and sent out to fabricators for pricing.

AISC-member Bannister Steel was selected as the fabricator and a mill order was immediately placed from the preliminary drawings. For speed and simplicity, a very clean design with concentric bracing was chosen. The structure utilizes a 28'x60' bay size. This large bay size is extremely efficient for parking structures. In the shorter direction, W16x26 beams, typically 10' o.c., were utilized, while in

the longer direction, the beams were typically W30x116. All of the members are Gr. 50 and composite design was utilized. The beams support 3" regular weight concrete fill over 3" metal deck.

For architectural reasons, hollow structural sections were used for the columns, except in the braced bays. The interior columns were TS 12"x12", while the exterior columns were TS 10"x10". W12x162 columns were used for the braced bays both for ease of connections and for their higher strength. Two braced frames occur on each side of the building on each level.

The 180' x 1,020' structure was designed to accommodate parking for 1,793 cars and was split into three rectangular structures, each approximately 340'x180', and separated with expansion joints. Two existing ramps, the main entry canopy and shear walls carrying existing services were incorporated into the new structure.

The structure is supported on drilled caissons. Concrete contractor on the project was Steven L. Carter Construction, Malibu, CA.

In 1996, Fashion Square added a third level to the existing two-story structure over one-third of its length. Access bridges and signage, which greatly enhanced the usability of the structure, also were added. The third level was constructed by Bannister Steel without difficulty or interference with the existing structure. Detailer for the second phase was Lyco Engineering Services Ltd.

The new structure is both efficient, attractive and truly adds to the ambience of this beautifully renovated shopping center. Additionally, the steel structure was 20% less expensive than the originally proposed concrete structure.

By Scott Kennedy, P. Eng., is president of Kensco Engineering Ltd., in West Vancouver, Canada.