

### Suspending Vertical Expansion Allows Uninterrupted Operation

Charles Pankow Builders entered into a design/build contract to expand the Galleria at Tyler Mall in Riverside, California in 1990. The mall was to remain in operation while a 192,000 SF second level was added. Existing anchor department stores with standard floor-to-floor heights of 19 feet insisted that the traditional method of adding a second level over the existing roof would be unacceptable. To make the expansion a reality, Pankow, working with McLean Steel and Robert Englekirk Consulting Structural Engineers, developed a design to maintain the 19 foot floor-to-floor height. Supported by an independent foundation consisting of more than 600 individual steel pipe piles, a new metal deck roof with lightweight open web joists and very large truss girders was erected, and spanned the tenant space of the existing mall. The new second floor was suspended from hanging columns attached to the bottom chords of these "super trusses" which spanned the tenant space. This system allowed the new second level floor to be built within the interstitial space of the existing roof and tenant ceilings. Once the new second level roof system was completed and a watertight envelope was formed, sections of existing roofing and deck were removed. Then a joist system was installed to support the ground floor tenants' ceilings, electrical, air conditioning and fire protection systems. This joist system served as a temporary working platform. Workers then removed the remainder of the existing roof and installed another joist girder system to support the new second floor.

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