1601 VINE, LOS ANGELES, CA

By

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POST-TENSIONING INSTITUTE ®

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Located in the heart of Hollywood and within steps of the famous Hollywood Walk of Fame stands 1601 Vine, an eight-story office tower with ground floor retail over a five-story subgrade parking structure (Fig. 1). Featuring high ceiling and open floor plan office space, 1601 Vine is likely to cater to a boutique market of entertainment-minded office users. With similar height and massing to buildings in the immediate area, 1601 Vine will contribute to the environment of urban Hollywood and provide much-needed premiere Class-A office space with private parking to the local area. In addition to retail space, the ground floor also provides bike racks, showers, and lockers for patrons to use and thus forego the use of a car to get to work or visit tenants. In addition, the project includes a cantilevered concrete slab canopy located approximately 15 ft (4.6 m) above street level, extending the full length of the building along both sides of the public right-of-way for pedestrian and occupant comfort.

1601 Vine provides a unique blend of form and function incorporating attractive architecture with efficient engineering. The office tower is cast-in-place concrete with a mixture of one-way and two-way post-tensioned slabs at the office floors, a conventionally reinforced concrete slab at the ground floor, and two-way flat-plate post-

Fig. 1—Architectural rendering of 1601 Vine.

tensioned slabs at subgrade parking levels. Lateral loads are resisted by an off-center shear wall core of varying wall thickness and foundation loads are supported by conventional shallow spread footings. The project also features full-height vertical architectural fins along the southwest and northeast corners of the building and a City of Los Angeles-mandated helicopter emergency landing facility on the roof. Construction is near completion and expected to finish in early 2017.

DEEP BASEMENT TEMPORARY SHORING WALL CHALLENGES

Just prior to construction, the design team was notified that the temporary shoring wall on the west side of the project would need to be internally braced due to lack of an easement agreement with the adjacent property owner. As such, the design team was tasked with developing a temporary bracing system that would remain in place during construction until all framing of the substructure was completely installed (Fig. 2). To this effect, a two-tiered diagonal bracing system was installed to brace the temporary shoring wall with an overall height of up to 60 ft. (18 m) This effectively created an "iron fortress" of structural steel bracing elements anchored at the base to cast-in-place concrete deadmen installed below and between building footings. Temporary blockouts at each floor and at each diagonal bracing element were strategically positioned and incorporated into affected slab geometry with minimal effect on the original post-tensioned slab design.

POST-TENSIONED SLABS AT SUBGRADE PARKING

In an effort to improve the overall construction schedule, the Contractor elected to install the basement wall full height in advance of the floor slabs by means of shotcreting against the temporary shoring system (Fig. 3). With this particular sequencing, careful detailing and design of delay strips, concrete mixtures, and curing proce-

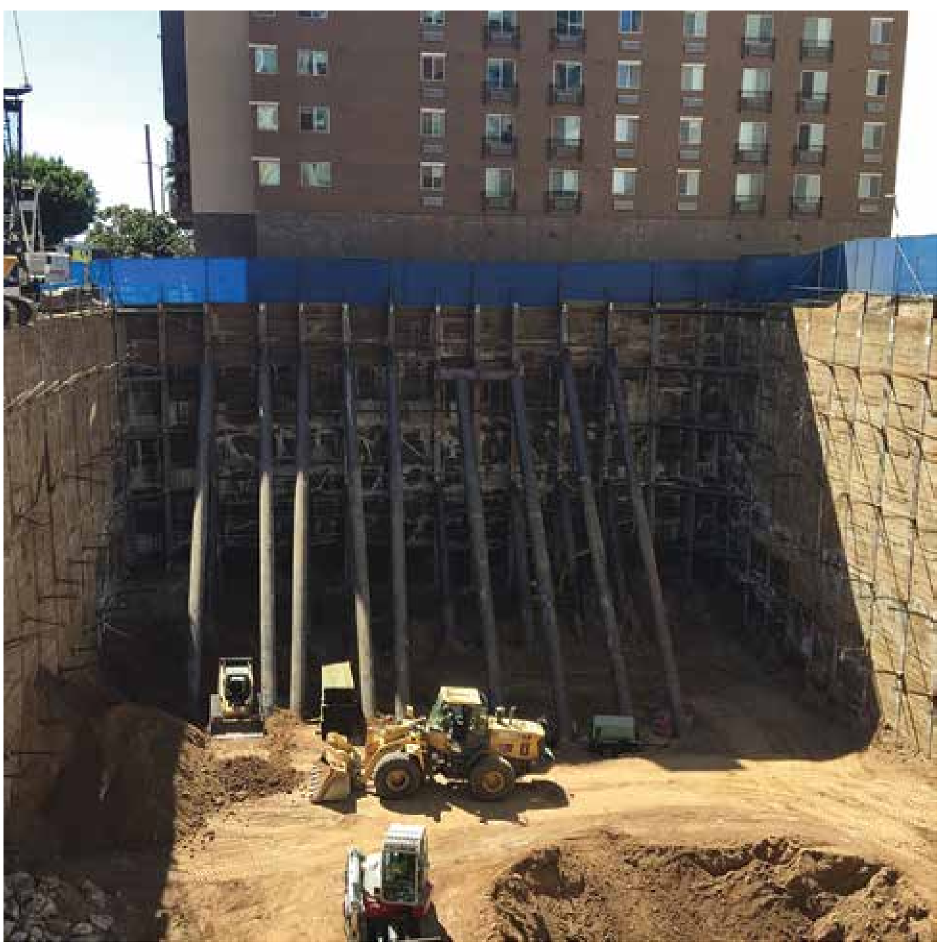

Fig. 2—Deep basement temporary shoring.

dures were required in an effort to minimize concrete slab shrinkage potential while also ensuring adequate subgrade slab tie-in to supporting basement walls to resist both vertical and horizontal loads. To that effect, a 3 ft (910 mm) wide delay strip was strategically located to avoid shear wall coupling beams and as close to the mid-section of the floor plan as possible. In addition, stressing pockets were also used to stress post-tensioning tendons that did not anchor at a floor opening, delay strip, or at the parking ramp split. Last but not least, concrete mixtures were specifically tailored to limit shrinkage and the curing procedure was specified to ensure slower and better controlled slab moisture release. The use of post-tensioned slabs below grade allowed for a virtually crack-free slab system while also providing an efficient means of reducing floor-to-floor height, overall structural material demand, lighter foundations, and reduced excavation depth.

LONG-SPAN FRAMING SYSTEM AT OFFICE FLOORS

To efficiently realize open space needs, a hybrid system of two-way post-tensioned flat-plate slabs with one-way post-tensioned slabs and wide-shallow post tensioned beams was used to achieve the desired layout with spans of up to 42 ft (12.8 m). This particular combination of framing systems resulted in only four interior columns to support over 15,500 ft^2 (1400 m^2) of floor space with an 8 in. (203 mm) thick slab. Formwork efficiency was realized by designing wide-shallow beam geometry to work with dimensional lumber and by standardizing beam sizes. In addition, enhanced flexibility in office space allocation was achieved by designing the hybrid floor system to support a uniform live load of 80 lb/ft^2 (3.8 kN/m^2)for unrestricted movement of both exit corridors and interior partitions while also satisfying minimum building code live load requirements.

Fig. 3— Basement wall installed against temporary shoring in advance of floor slabs.

Fig. 4—Long-span framing system at office floors.

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Architect: Ware Malcomb, Los Angeles, CA
Contractor: JH Snyder Construction, Inc., Los Angeles, CA
PT Supplier: Superior Post-Tension, Henderson, NV

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