



California Palace of the Legion of Honor San Francisco, CA

Schnabel Foundation Company was awarded the subcontract to design and install a shoring and underpinning system for the Legion of Honor Memorial, originally built in 1922, and located in Lincoln Park, San Francisco. The construction of new galleries underneath the existing courtyard required shoring the perimeter of the building with conventional soldier beams, tiebacks and lagging. The courtyard colonnades, the entrance arch and the porch structure of the building needed to be supported during construction. Schnabel supported the structures with needle beams spanning between drilled soldier beams and/or existing walls. The structures were jacked to transfer the load to the underpinning elements. New service and ventilation tunnels were added inside and underneath the existing building which required underpinning a total of 46 columns with loads of up to 250,000 pounds. Underpinning the columns was done using different systems including hand-dug piers, rakers supported on heel blocks, shear plates bolted to existing columns spanning between support frames, and drilled piles supporting shear walls built from top down. Low access drilling equipment was extensively used with experienced underpinning crews. Most of the building columns were jacked to substantially reduce or eliminate settlement. The project was complicated by the discovery of an existing graveyard underneath the building - approximately 700 coffins were removed by archaeologists. The shoring and underpinning systems performed extremely well with settlements on average lower than a quarter-of-an-inch.

Owner: Palace of Fine Arts & the City of San Francisco
 General Contractor: Hensel Phelps Construction, San Jose, CA
 Design-Build Shoring Contractor: Schnabel Foundation Company, Walnut Creek, CA

<http://www.schnabel.com>