Lakehouse on 17th

Category 6: Best Building Project – Specialty Contractor (\$6M - \$10M)

Ludvik Electric Co.

Reflection Upon Sloan's Lake

Sloans Lake Park, the second largest city park in Denver, has been a family gathering area since its inception over a century ago: when two brothers allegedly dug a hole for a well. As the story goes, this man(made) hole pierced the surface of a natural artesian spring (aquifer), flooded rapidly, and became what we now know as Sloans Lake. Since then, homes, restaurants, and even an amusement park have popped up in the surrounding area. Sloans Lake has caused a ripple effect in the vicnity, carving and shaping the Sloans Lake neighborhood.

Today, the lake occupies a large section of the northwest-side of Denver at the heart of the Sloans Lake neighborhood. Less than a mile west of the Denver Broncos stadium and two miles from Elitch Gardens, the lake is at the center of a diverse, active, growing neighborhood. An influx of new commercial and residential real estate developments has cultivated the growth between Colfax and 17th Street. As a result, Sloans Lake now bears a new reflection: A 12-story, glass high-rise, rightfully called Lakehouse on 17th. A massive engineering and construction project that has become a focal point of the area and new face to urban living.

The Lakehouse on 17th project is a luxurious 457,262 square foot, 197-unit, mixed-use development with three levels of parking garage. The developer of the Lakehouse, NAVA Real Estate Development (NAVA), picked amenities that would improve the well-being of the residents; including a private garden, gym, pool, yoga room, and sauna. Lakehouse is notably the first development in Colorado focused on achieving the Well Building Standard – a nationwide standard focused on human wellness within the built environment. When attained, the certification would endorse a high-end living space carefully constructed to provide for its

residents beyond that of a typical dwelling; addressing occupant health in the categories of air, water, light, nourishment, fitness, comfort, and mind, in Lakehouse's design.

The requirements for attaining this Standard are only met with a great amount of planning and careful execution in every aspect of Lakehouse's construction. Not only did Lakehouse need to be built on a tight schedule, but with so many amenities and features, it took significant coordination between all trades, contractors, and design professionals. It was fitting that the local electrical contractor; Ludvik Electric Co. was selected to perform the electrical work.

Although Ludvik undertook substantial preconstruction and Building Information Modeling (BIM) efforts prior to the beginning of any construction, the real planning came after a call-toarms from NAVA and the general contractor. In response to this call-to-arms, major subcontractors along with the design team came together to openly discuss issues, concerns, sequencing, significant BIM coordination items, and execution of the project. One thing became clear: the Lakehouse project was going to be impressive – but certainly a challenge.

Ludvik prepped their team following the team building session. Management met with both the Ludvik field staff and a newly revamped Ludvik prefabrication department to discuss upcoming obstacles including the tight schedule, significant amount of work, and zero on-site storage space. It was agreed that this job would be the perfect opportunity to utilize prefabrication in all phases of construction. However, significant design variance among the communal areas, amenity level, corridors, and unit types would make it a challenge to produce "cookie cutter" prefabrication assemblies. For example, there were approximately 67 unit-types among the 197 units, ranging from 497 to 3,357 square feet. 1,300+ RFI's and 45 ASI's required "on-the-fly" updates and keen information management.

Prefabrication allowed Ludvik to utilize cutting-edge technology, implement efficient processes, and maintain the overall budget throughout the rough-in phase of construction. For three

2

months, Ludvik developed layout drawings for Ludvik prefabrication and the BIM modelers for clash coordination. Ludvik managed the BIM modeling for the layout of the electrical systems by way of the Trimble Total Station (TTS). The TTS was an early investment by Ludvik which saves substantial time during layout of concrete decks, as it eliminates a significant amount of hand measurements in the field. The TTS is an advanced piece of surveying equipment that produces x and y coordinate layout points. It utilizes one touchscreen interface and two tripods, shooting infrared lasers from one tripod to another to determine the exact locations. Control points from structural columns allowed for pinpoint accuracy and the TTS system reduced layout duration. Technology and communication allowed Ludvik to build these advanced deck layouts prior to the initial concrete deck pours, allowing us to install in the correct location.

Prior to the first concrete deck pour, Ludvik had plans on pathways, sleeve locations, and the means to fabricate the structural side of the build. Prefabrication assemblies contained hundreds of thousands of feet of PVC conduit, CLX cable, and hundreds of deck j-box or four-square boxes all numbered with specific locations. Electrical, mechanical, lighting, fire-alarm, generator, and temporary power each had a significant amount of rough-in accomplished in the decks. The TTS designated exact points for rack layouts, stub-ups, receptacle, and lighting locations based on the BIM models. Just-on-time deliveries of prefabrication assemblies were coordinated heavily with the prefabrication department and timing was crucial with only two days for electrical systems rough-in for each ten-day concrete pour break duration. In addition, many site activities required scheduling days in advance, such as crane picks. Ludvik was able to avoid trade stacking with swift and efficient planning and execution.

Once the forms were stripped and framing contractors were complete, Ludvik's in-slab boxes were already in accurate locations with rough-in and wire pull completed. After the floors were dried in and walls were framed, the interior rough-in commenced and assemblies would arrive to complete build-out of the lower floors. Pallets of interior rough-in, prefabricated material would be labeled for each area and with specific unit numbers to take any guesswork out of the installer's hands. Prefabrication resulted in material consistently arriving on time and ready for install.

3

Ludvik managed approximately twelve subcontractors throughout the duration of the project, providing several value-added solutions. For example, the original lightning protection design and specification called for the Franklin Rod System, a material and labor-intensive installation that was not aesthetically pleasing to the ownership. The design of the building, with several rooftops of different elevations, would require each roof to have a large number of aluminum and copper conductors, and air terminals across them in plain view of residents looking down at roof. Ludvik partnered with their selected lightning protection subcontractor, VFC, to provide a value-added solution for the lightning protection that would visually please the ownership. Ludvik submitted a specification substitution request for the Early Streamer System (ESS). The ESS was considerably less expensive with 95% fewer parts, fewer terminals, and less wire. The design was sleek with only one air terminal mast located on the top of the 12th story roof. The design provided a savings to the owner of approximately \$30,000 and they were assured by the fact that ESS system has been used at reputable locations such as the Denver Broncos Stadium, Coors Field, and Denver Health.

In addition to the ESS, Ludvik and its subcontractors provided a 450kW diesel generator, over 6,400 light fixtures, the entire low voltage horizontal cabling and backbone internet system, CCTV and access control security system, cellular booster system, BDA radio amplification system, audio/visual system, and the installation of fiber optic star ceiling lights in the yoga room with hand-made constellations of The Big Dipper, Little Dipper, Orion, Taurus, Gemini and Southern Cross. Ludvik's work is found throughout the Lakehouse project.

From day one, Ludvik made safety *the* priority by implementing safety procedures to keep Ludvik and all other contractors safe. Supervisors held weekly safety meetings and provided training on equipment, tools, material use, and common best practices. Topics ranged from confined spaces, emergency evacuations, hazardous materials, and arc flash to other electrical hazards, terrorism and security. Ludvik provided Material Safety Data Sheets books, indexed with all hazardous materials that would be on-site. Twice each month, Ludvik's safety manager conducted a safety audit on the project to inspect the current working conditions. As a result of these safety measures, Ludvik worked over 100,000 hours on this project with zero lost time. Ludvik maintained quality control and assurance documentation along every phase of the project, investing over 2,700 hours to ensure the quality of its own work as well as its subcontractors. Ludvik conducted its work on the Lakehouse with exceptional service, quality, and integrity - values in Ludvik's very own mission statement. Extensive planning, design, prefabrication, coordination, value engineering, and thoroughness in all phases of construction enabled Ludvik to produce a quality product, worthy of the Well Building Standard. The Lakehouse captures the sleek look of a modernized building and enhances the lives of its residents and the surrounding Sloans Lake community. Ludvik reflects proudly on the Lakehouse on 17th, as it has set the bar for multi-family developments.









