Animal Hospital Rehab

Workflow and planning were critical in keeping this emergency care facility running 24/7

BY DAN WATSON

One of the tricks of commercial construction is the ability to renovate office space without shutting the business down. We have a lot of experience with that, but none of our previous projects were as challenging or unique as the project described in this article, the renovation of a busy traditional veterinary practice that included an emergency room for the animals. At the time of this project, the clinic employed more than 20 doctors and 100 full-time staff members to provide both routine and urgent 24/7 veterinary care.

The core of the project was adding offices to unused space directly above the most active area of the hospital, the "treatment room." This area served as the emergency room, where many of the practice's patients were brought during the day; at any one time, there could be 10 or more animals and many more staff using the area. Also being renovated were existing offices that could not be shut down during normal business hours and attic space (filled with sprinkler lines, ductwork, plumbing, electrical wiring, network and camera wires, and suspended ceiling support wires) that was located above several other rooms and active kennels.

The actual work to renovate the space and build new offices was fairly straightforward; when we bid the job, we knew that profitability would be won or lost based on our planning and management of the logistics of the construction. Because we had experience with renovating businesses while they were open and would be

Photos by Dan Watson

self-performing much of the most invasive work, we were confident we would be able to work during normal business hours and keep the client happy. To do the job as economically as possible, we had to work closely with the client, our trade partners, the architect, and the local building department.

ACCESS, DUST, AND NOISE CONTROL

During our pre-bid planning, we had investigated the existing construction and site conditions, which we were able to compare to the original building plans. We discovered that there were load-bearing walls immediately adjacent to the proposed perimeter of the new second-floor spaces, and that the gridwork above the treatment area was able to accommodate a moderate floor load. It appeared as though the original plan for the building included a second floor, but it was never built. We had taken advantage of this in our bid and made our proposal contingent on the architect approving our means and methods and amending his plans to reflect our new plan and design.

Temporary floor. The existing gridwork above the ceiling of the treatment room made a perfect support for a new, temporary floor system below the elevation of the new second-floor framing **(1)**. Once built, the new floor would provide a noise and dust barrier between the client's space below and the active construction above.

The best option for the temporary floor was a modular platform system, which would allow us to install the panels quickly with little impact on the staff, and to remove them easily at the end of the project. We prebuilt the modular panels at our shop using 2x4 joists and 3/4-inch plywood decking and then delivered them to the jobsite, carefully measuring all the openings prior to ordering materials so we could calculate the spans and tolerances of the design.

Our goal was to install the panels quickly and safely above the treatment room, so size and weight were huge concerns. We were able to limit the total weight of each panel to about 120 pounds, which meant that two or three people could easily move and lift them into place. Most of the openings in the gridwork could be filled with a single panel, which we framed with joists 16 inches on-center **(2)**. The largest opening required two panels, which we framed with joists 12 inches on-center.

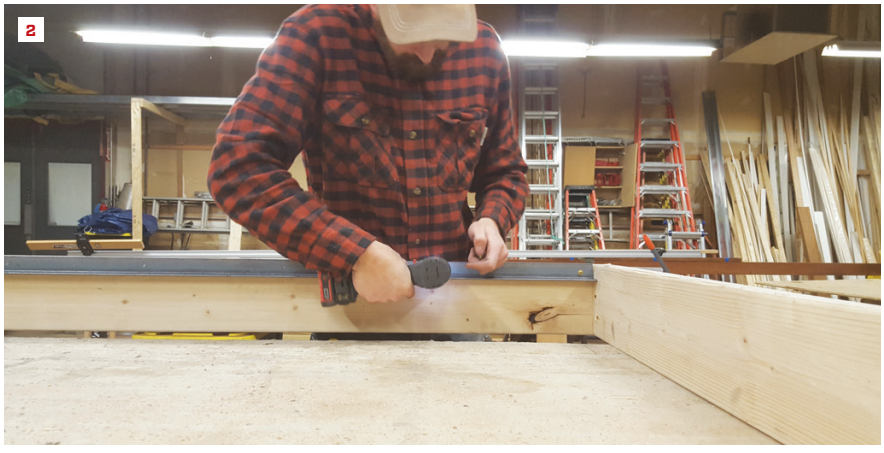
We built 2x6 frames for each panel, fitting the frames with steel angles to create a ledge for the panel to drop into **(3)**. We sized the steel so we could make the panels even and square even though the openings were inconsistent. Because we planned to remove the panels at the end of the project, all of the fasteners in the frames were installed so they could be removed from below. As we installed the panels, we also had to modify the existing ductwork so the new space below would have the required supplies and returns. Once the panels were installed, we sealed the seams with tape to prevent any dust and debris from demolition and framing from falling into the space below **(4, 5)**.

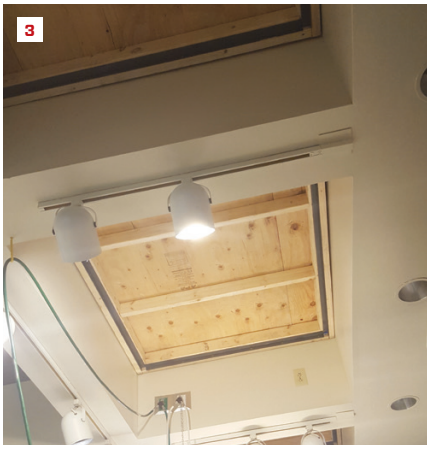
New door. Whenever we worked in occupied spaces, we took measures to completely separate our work from the staff and provide adequate safety and dust control measures. So we waited until the floor panels were in place and the second floor sealed off from the first before removing a glass partition wall between the existing second-floor offices and the new construction area. We left all of the debris on top of the panels to be removed later, once we had better egress from the building.

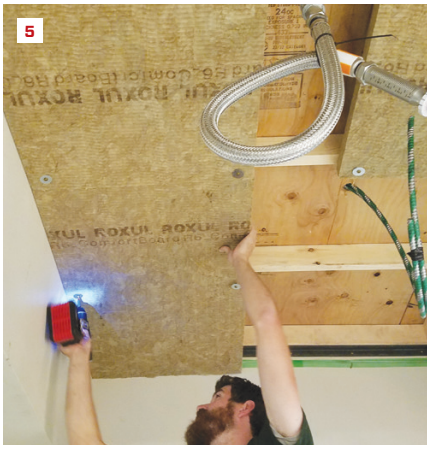
To minimize disturbance from the second-floor construction, the author added a temporary floor system to the vaulted ceiling's gridwork above this treatment area, which needed to be available to staff and patients 24 hours a day **(1)**.

A single set of stairs led up to the second-floor offices, which were located in the front of the building; to access the stairs, you had to walk through busy hallways and congested work areas on the first floor. Those offices would eventually be moved to the back of the building, so to avoid traveling through the hospital, we created a new second-floor entrance directly into the attic. This kept the construction and the practice separate, allowing us to work when we needed to and bring in larger materials without issues **(6)**.

Our new access into the building was adjacent to a new parking lot, created to address concerns about parking and on-site exterior storage. The existing parking lot was already beyond capacity, and the clinic struggled to accommodate the required client parking. Early in the project, it was decided that a new stone parking area







Panels for the gridwork were designed to be removable, and were prefabricated off-site **(2)**. Framed with 2x4s, the panels rest on steel angles fastened to 2x6 frames that are fastened to the gridwork **(3)**. The panels were taped to the gridwork from above to keep dust and debris from dropping down into the treatment room **(4)**. After the decision was made to leave the panels permanently in place, Rockwool mineral-wool insulation was added to the assembly for both fire resistance and for soundproofing **(5)**.

with dedicated delivery areas would be provided. This created a landing zone for lumber drops and easy truck access, and we were able to put our jobsite storage container in a location that was convenient for us and out of the way for the client.

Once the majority of the construction was completed, we planned to replace the new staircase and door with permanent finishes. But using pressure treated treads and temporary finishes in the meantime meant less care had to be taken when we moved supplies and materials in and out of the work zone.

We regularly use helical piers to support deck and porch framing, and this project was another example of their many benefits. The new landing and staircase were built above the existing air-conditioning condensers, so we had limited access and small spaces to work with. Instead of using large, traditional concrete footings, we were able to quickly install the helical piers without impacting the condensers and immediately begin to frame the landing.

While the finished stairs were to be built parallel to the back of the building, we built the temporary stairs so that they were perpendicular. This allowed us not only to bring long joists straight into the building but also to build the second permanent stairs at any point without having to remove our utility stairs.

FRAMING

One of our main concerns with performing the proposed work around the staff and animals was their safety. Loud noises—specifically from nail guns, compressors, and impact drivers—would add to the already hectic and loud environment below us and unnecessarily add to the stress the animals were already under.

A new entry was framed on helical piles to provide outside access to the second floor **(6)**. In a connecting hallway, a temporary ceiling allowed occupants continued use of offices and the treatment room while work proceeded in the dropped ceiling above **(7)**. A new floor framed with I-joists and engineered beams extends in one level across the existing attic and above the old ceiling gridwork **(8)**. The attic was filled with ductwork and other mechanicals that had to be moved as the framing progressed **(9)**.

Coupled with that, sometimes there would be little physical barrier between us and the activities below, so we decided that we would use no air-powered tools during construction unless absolutely necessary. That meant using structural screws instead of pneumatic nails to fasten almost all of the framing together, requiring coordination between us, the architect, and the building department to get approval.

The renovation of the second floor was phase one of a two-phase project, which would later include a large addition to the building. Part of the planning for the second phase included creating access to the addition from the renovated space. Because we had to raise the floor elevation over the ceiling gridwork, a step down to the original office floor elevation was required here, and in the front office where a restroom and stairs to the first floor were located.

An existing beam ended short of the proposed floor system. Unfortunately, this was also over the only hallway between the bullpen—a combination break room and place where workstations for the doctors and staff were located—and the rest of the hospital. It was a busy travel route, with entrances into the two staff restrooms also located in this short hallway. In order to work safely and efficiently while reframing the floor system, we built a temporary platform above the hallway and below the existing suspended ceiling, allowing us to work over the active hallway without interfering with the foot traffic **(7)**.

The new floor framing was primarily composed of 22-foot-long TJI joists installed 12 inches on-center, with a few LVL and PSL beams thrown into the mix. Because load-bearing CMU walls were already located close to where the architect had proposed the joists were to end in the original, unvaulted second-floor design, it was easy to spec and install slightly longer joists that could bear on these walls **(8)**.

First, though, we had to extend the height of the existing walls to make the floor for the entire second floor one level. We also needed to accommodate existing sprinkler lines, as well as I-joist and roof truss rafters that were already bearing on the walls. To achieve the necessary elevation, we installed short LVL beams padded out with 3/4-inch plywood sized to fit between the trusses on top of the 2-by plates capping the CMU walls.

MECHANICALS

The existing attic space looked like a typical commercial attic, filled with mechanicals that had been modified year after year, with no expectation of the space being used for anything else **(9)**. In order to safely work in the attic and move the mechanicals without shutdowns, we performed the work in phases. We would build several feet of new floor framing, and then mechanical trade partners would install new work or move existing mechanicals. We also had to work around the wires that supported the suspended ceiling over the first floor (there was no existing floor system

With the subfloor complete on the upper level and new ceiling joists installed **(10)**, work could begin on framing partition walls to define new spaces and for the closets where mechanicals and panels for electrical and network equipment could be located **(11)**. During the job, multiple BuildClean air cleaners were employed to manage dust. A new multi-head mini-split HVAC system was installed to heat the new break room and open and private office spaces on the second floor **(12)**. In the treatment room, the gridwork ceiling was fitted with the framework for a suspended ceiling after the various lines for oxygen, suction, and the sprinkler system had been extended or reconfigured **(13)**.

for the attic space). Once all the work that could be efficiently performed was completed and we had moved the suspended ceiling wiring for one section, the cycle would start over again with additional framing being installed.

Because we did not have access from below, all of the MEP work had to be done after the new floor was framed but before the subfloor was installed. At this time, we also installed the sprinkler, oxygen, vacuum, and electrical wiring that would be needed for the treatment room below. Once this work was completed, we installed Rockwool mineral wool insulation between the floor joists to help with sound control and fire protection prior to screwing down the subfloor sheathing.

Where the new rear entrance was located, we had constraints with existing electrical, plumbing, and HVAC systems. It was not cost effective to move those mechanicals, so we installed a beam to carry one end of the new joists, while the other end of the joists bears on the existing wall. This created a hallway with closets that would be used by the office staff. We were also able to house the new network equipment in one of the closets **(10, 11)**.

It was decided early that a new subpanel for the second floor made the most sense. This allowed us to limit shutdowns of the existing system and it kept us out of the first-floor bullpen where the existing panels were located.

A new mini-split HVAC system was installed for the second floor, giving the break room, open offices, and private offices temperature control and eliminating the need for the additional ductwork in already overcrowded wall and floor spaces. We framed a shelf on the side of the rear stairs to support the exterior components of the system **(12)**.

The most time-consuming and invasive mechanical work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As the project wrapped up, the construction access was transformed into a permanent second-floor entry with a new set of finished stairs **(14)** and a porch roof **(15)**. In the office at the other end of the building, the floor level steps down to the original floor level for access to an existing staircase (at left) and to a restroom (at right) **(16)**. The new second-floor break room and workspace above the existing first-floor treatment room is lit by the building's original skylights **(17)**.


16


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involved the sprinkler system, which was a wet design in unconditioned space. The pipes were filled with 165 gallons of an antifreeze liquid that had to be drained and then pumped back into the system every time work was performed. Also, when the sprinkler system was being worked on, we had to maintain a fire watch: We had to notify the local fire department whenever the system was down, and both a staff member and someone from our company had to be on watch for any potential emergencies.

FINISH LINE

Because the second-floor offices could not be shut down, we had to complete the new offices before we could move the staff out of their old rooms. Once they moved, our rear construction entrance would become their primary entrance—and we would be walking through the new offices to continue the project **(14, 15)**—so we decided to load the majority of our materials into the space between the new and the old to limit our impact on the staff. This again required some night work and a lot of coordination between our team, the client, and the staff **(16, 17)**.

For fire safety reasons, we had originally planned on removing our temporary floor panels before finishing the gridwork ceiling of the treatment room. The plan was to support the panels from below, remove the fasteners, and then drop the panels down to dispose of them. But in the end, the fire inspector provided us with a few limited options that would allow us to leave them in place. Because the wood framing could not be left exposed, one option was to cover it with drywall, but that was not possible because of the time and mess associated with installing and taping. Another option, installing stone wool insulation, satisfied all of the inspector's requirements, as well as our own. We were able to install the Rockwool batts quickly from below and then move right on to the new suspended ceiling work in the treatment room **(13)**.

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