

Your Multifamily Acquisition/Rehab Project

Three Steps to Energy and Financial Success

By Matt Holden, PE, Sparhawk Group

Your affordable multifamily housing acquisition/rehab project begins with a vision of an efficient and comfortable building at completion. But after lease-up will you actually achieve the expected high performance in energy and water efficiency designed into the project, and therefore peak financial performance?

There is ample evidence that high performance buildings do not achieve the projected efficiencies. The reason is largely human error: faulty operation and maintenance of the property's systems and equipment. You can retrofit your multifamily property, but unless you properly plan the project and train and equip the on-site staff, those expected savings will go out the window.

So what can you do to ensure financial performance? One smart move is to integrate (1) energy efficiency with (2) building commissioning and (3) systems-based training and manuals.

Our company provides a continuum of services that help the staff in an acquisition/rehab project make the transition from the old energy "pig" to the new, more complex energy-efficient building. We do this through a highly effective three-step process we have developed and applied that ensures owners of consistent, long-term utility savings and positive financial results.

Step 1: Energy Assessment

The first step is conducting an energy assessment of the building. This is a financial tool that examines your multifamily property as it currently operates for energy and water efficiency and spells out which specific capital improvements could be made to significantly improve the building's performance, resulting in long-term energy and water savings. These improvements might be such steps as installing better insulation, air sealing, water conservation devices, or a new HVAC system. Reducing energy consumption reduces the variability in year-to-year operating costs as energy prices rise and fall.

The cost of many of the efficiency measures can be offset by incentives and rebates from utilities. Crediting the energy savings to the building pro forma has enabled many of our clients to assess additional capital for the transaction. The financial tool of the Energy Assessment needs to address capital cost, savings, incentives, and how additional debt can be supported with energy savings.

The energy assessment is done during the pre-con-

struction phase and its findings evaluated against other physical changes planned for the building as part of the broader rehabilitation project.

Advocating the incremental cost of additional efficiency is vital during pre-construction. For example, when installing energy-efficient new lighting in stairwells, additional savings can be achieved by adding controls that reduce the power consumption by 50% when the stairwells are not in use.

Similarly, combining air sealing, new energy-efficient windows, and improved insulation can create synergies that reduce the needed size and cost of the HVAC systems.

During the pre-construction phase, the energy assessment identifies priorities and overlaps and suggest enhancements to the base scope of rehab work (such as the light controls above), to stretch the project budget the furthest and ensure that the completed development will have the lowest long-term utility and maintenance costs.

Step 2: Building Commissioning

Commissioning is a service comprised of multiple actions designed to ensure that the completed project will deliver the high performance energy and water efficiency that the owner expects. Actions that are part of the commissioning process include:

- Review of and comment on the design documents.
- Inspecting and starting up equipment to make sure of proper installation and settings and that the equipment performs as designed.
- Documenting the operation of equipment and verifying warranties.
- Reviewing how the building and its systems are to be operated six months after start-up (e.g., in winter if the building is completed in summer).
- Assuring any problems are repaired under warranty. Contractors and equipment manufacturers typically provide a one-year warranty. Therefore, 10 months after start-up, this process involves making a list of everything that is out of performance and needs to be addressed before the end of the warranty period.
- Inspecting and testing the building for air tightness,



Matt Holden

Steps, continued on page 11

Steps, continued from page 10

which has a significant impact on utility consumption, comfort, and indoor air quality.

Educating on-site maintenance staff about the proper settings, operation, and maintenance of the installed systems and equipment is vital for peak performance going forward. This includes leading the staff through the proper settings and operational procedures for each season of the year. The commissioning agent can be the best person to train the operations staff, especially if his or her company also did the initial energy assessment. This will ensure the transfer of the institutional knowledge gained from the energy assessment, design phase, and construction phase.

Step 3: System-Based Operation and Maintenance Manual

The third step is creating a systems-based operations and maintenance manual. This manual includes:

- A description of each system and a description of each component in the system, its function, and details about proper settings and recommended maintenance.
- Photographs of each component in the system, such as the boilers, pumps, controls, and storage tanks for the domestic hot water system.
- Simple flow diagrams showing how each system operates. For example, showing boilers generating heat that is then distributed by pumps and piped and controlled by in-unit thermostats and valves.
- Recommendations for maintenance, which can be further broken down to maintenance by staff and maintenance by external sources. This allows for apples-to-apples bidding of service contracts after the original one-year warranty expires and ensures the completion of required maintenance during the warranty period.
- Troubleshooting trees for system problems, such as the steps to take if the domestic hot water system is not producing hot water.
- Appendices, including the equipment manuals and installation documents from the manufacturers or suppliers, with contact information for each component.

Educating on-site maintenance staff about the proper settings, operation, and maintenance of the installed systems and equipment is vital for peak performance going forward.

Benefits of a systems-based operations and maintenance manual include:

- Written documentation that site maintenance staff can refer to in the future as they operate and maintain the building’s systems and equipment to ensure everything is working properly and performing at peak efficiency.
- A document of “institutional knowledge” of how the buildings operate that remains with the building as site staff turns over.
- A tool that property managers can use to ensure efficient operation of the building. Managers can determine whether the building is running differently from the manual and take corrective steps.
- Common language for site staff, maintenance managers, and the commissioning agent.
- A common reference document that all parties can access during a conference call on addressing operations issues. It also supports the natural escalation of addressing an operations issue (i.e., first troubleshooting by site staff, then calling the maintenance manager, and finally contacting the commissioning agent/engineer).
- Documentation that service contractors can refer to during any major replacement/repair work so that the equipment is returned to its original operation.

We have repeatedly used this three-step process to enable our clients to maximize value in both acquisition/rehab transactions and in making improvements to existing properties. Applying the three-step process to acquisition/ rehab projects can generate future energy and water cost savings that can leverage a larger project budget. Meanwhile, the operations and maintenance manual engages and empowers the staff and helps transition the staff to a new operating paradigm. **TCA**

Matt Holden, PE is President of Sparhawk Group, an engineering and consulting firm with offices in Portland, Me. and New York City that has driven energy efficiency into more than 20,000 multifamily housing units and commissioned more than \$800 million in new construction. He may be reached at 207-847-6800, mholden@sparhawkgroup.com