

By Amanda Parolise

Parolise is project manager consultant with BuildingSmart Software LLC. Reach her at [amckew@yahoo.com](mailto:amckew@yahoo.com).



## New Child Care Room Addition Design-Bid-Build Project

This month's Facility File will focus on the B2B 2,000-sq-ft child care room addition to a preschool and kindergarten building. The new heating zone added to the existing hot water heating system is an underfloor radiant heat system with a separate heating and ventilation unit to serve this new addition.

The school has its own in-house O&M staff. The HVAC design engineer will meet with the O&M staff to discuss specific building standards that need to be applied to this project. The preschool owner shall retain a 3rd-party commissioning and TAB consultant to assist in system verification and functional performance.

The project delivery is design-bid-build (DBB) so there will be no interaction between the owner, O&M staff, design team, and the building during the design phase. The design engineer will specify in the contract bid documents the method of data collection of equipment in a manner that will make seamless the compilation of the PM workorders to populate the existing preschool CMMS system, so that workorders are ready for day one of owner occupancy.

It would be very beneficial for the preschool O&M staff to have access to 2015 *ASHRAE Handbook — HVAC Applications*, chapter 7 (Educational Facilities), chapters 36 through 43 (Building Operation and Management), and chapter 59 (HVAC Security) for design guidelines to assist in the training in the design phase. In addition, they should read chapter 6 (Radiant Heating and Cooling) of the 2016 *ASHRAE Handbook* for information regarding radiant heating and underfloor heating systems.

In the design phase of the project, the preschool's O&M staff will want to contribute information to the design team's writing of the contract specification and more specifically the following activities: service contracts, parts inventory, and as-built drawing requirements. Reviewing the design documents, this O&M staff will want to be assured that equipment serviceability will be adequate.

For a building program, as well as for a business plan to successfully manage the existing building heating system and other support services within the school, it is imperative that the program include an O&M budget in addition to the program's construction budget.

In the construction phase, the O&M staff will want to revisit the issues noted above during the design phase. Next comes the startup, TAB, and commissioning phases, and the O&M staff will want to be proactive in following along with the general contractor's mechanical-electrical coordinator and the subcontractor's startup personnel and receive equipment/system training from the heating subcontractor's startup technician and system training using the O&M manuals and contract drawings (that will eventually become the as-built drawings).

Once the startup has been completed and the ATC subcontractor and 3rd-party CxTAB consultant have completed the water balancing work, the HVAC subcontractor shall go through an automatic control system initial dry-run demonstration. This will take place prior to the general contractor and his mechanical and electrical coordinator demonstrating the system to the CxTAB consultant. The ATC subcontractor should also begin collecting system performance by trending pertinent HV system and equipment data as follows:

- outdoor air dry bulb and wet bulb temperature
- in-room air dry bulb and wet bulb temperature
- primary hot water supply and return temperature
- secondary/heating zone hot water supply and return temperature
- floor surface temperature
- alarms
- safety control points

Taking the same approach as the design engineer, the preschool's O&M personnel should use a series of computer-generated touchscreen project checklists that allows the staff to confirm that the following facility files have been collected. This process should start at the beginning of construction and not at project closeout, so that the facility files can be inputted into a CMMS workorder system. Touchscreen O&M checklists should include:

- equipment shop drawings
- O&M manuals, parts list, and lubricants
- troubleshooting tips
- seasonal startup and shutdown instructions

The O&M staff should review the contractor-produced piping field fabrication/field coordination drawings prior to fabrication. Touchscreen service checklists should include:

- location of shutoff valves, ATC valve, and balancing valve
- circulator
- control devices
- access for servicing equipment.

The training process should include specific heating and ventilating system and equipment training. The water balancing of the radiant heat zone along with the final TAB report should be included in the PM workorder system for re-balancing in a couple of years. This requires the CxTAB consultant to provide the water balancing reports along with the associated system flow diagrams, noting quantities and pressures for rebalancing if necessary as part of the project closeout documents. Touchscreen training checklists should include:

- equipment
- system
- automatic controls
- energy management