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Project Case Study

Southeast Michigan Psychiatric Hospital

Northville Township, Michigan

Installation Site Overview

When Joe Cruz, Senior Mechanical Engineer/ Associate and healthcare specialist at Integrated Design Solutions (IDS) in Troy, Michigan, began working on a new psychiatric healthcare facility in Northville, Michigan, he knew he had a challenge ahead of him: ensuring every patient room could receive hot water quickly and consistently throughout an expansive domestic hot water recirculation system.



Discovering Thermostatic Balancing

Cruz has encountered domestic hot water return issues on previous healthcare projects. “It is very common to wait for long periods of time before receiving hot water at sinks and showers in various facilities, even when they had traditional recirculation systems,” he recalled. Those experiences led him to question the traditional approach to balancing domestic hot water recirculation systems.

Most systems rely on manual balancing valves that require careful flow calculations and field adjustments. “Many engineering drawings I’ve seen show the balancing valve set at 0.5 GPM for every single return location,” Cruz said. “That is a tell-tale sign of lazy engineering. You must calculate the flow based on the piping run, pipe size, and the desired return temperature. Nobody ever seems to do it right and one-time balancing does not necessarily facilitate future renovations and expansions, so we started looking for a better way.”

Cruz first specified CircuitSolver in 2015 while designing a healthcare facility in North Ridgeville, Ohio. After evaluating several options, his team selected CircuitSolver because its stainless steel construction offered long-term durability while its thermostatic operation eliminated manual balancing. Approximately 15 to 20 CircuitSolver valves were installed for that project.

“The solution was simple and we never received a call about hot water issues on that building,” Cruz recalled. “Manual systems required significant time to commission and often needed readjustment over time. If owners need to rebalance their domestic hot water return system every time they modify their building, it’s not simple anymore, right?” Cruz said. “We were looking for a more reliable and predictable approach.”

Based on that experience, Cruz continued specifying CircuitSolver on healthcare projects.

The New Opportunity

Cruz's latest project was the new Southeast Michigan Psychiatric Hospital in Northville Township, Michigan, scheduled to open in October 2026. The facility consolidates two existing psychiatric hospitals into a 231-bed campus with separate adult and pediatric treatment areas. Its domestic hot water system serves 268 recirculation zones throughout the facility.

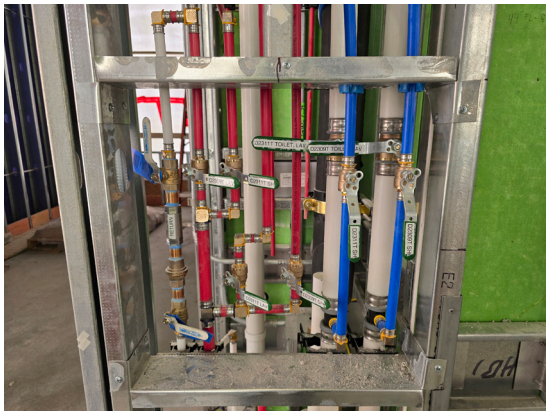
The facility includes four two-story adult wings and three single-story pediatric wings and approximately 180,000 square-feet of facilities, administrative and common spaces. To serve all 268 recirculation zones, 268 CircuitSolver valves were installed, one on each hot water return branch within 25 linear feet of the last fixture as recommended by The Facility Guidelines Institute (FGI).



To accelerate construction, the project incorporated 231 prefabricated patient-room bathroom pods to streamline installation and improve cost control.

Each patient bathroom includes an access panel located in the corridor wall, where individual fixture isolation valves are installed, allowing staff to quickly stop water flow in the event of an emergency. CircuitSolver valves were incorporated into the access panels for each patient restroom which place them 18-24 linear feet of the furthest hot water consuming fixture.

The Result



During system startup, the design team verified hot water delivery at the facility's most remote fixtures.

"We have instantaneous domestic hot water heat exchangers being served by a dedicated dual-fuel boiler system" Cruz explained. "The furthest shower is about 1,115 feet from the domestic hot water heat exchangers, and we observed hot water within ten seconds in a system with little to no use (during construction). When we tested the furthest manually operated sink from the central utility plant, located 1,005 feet away, we observed hot water in approximately 8 seconds."

Cruz said the installation and commissioning process was straightforward with CircuitSolver. "CircuitSolver saved a lot of time typically spent on balancing. There were no balancing calculations required for each circuit and no rebalancing required after startup." The only balancing required is dialing in the hot water recirculation pump speed to maintain the desired return water temperature.

Based on consistent performance across multiple healthcare projects, Cruz has incorporated CircuitSolver thermostatic balancing valves into Integrated Design Solutions' standard plumbing details.