

Case Study

Quinn Chapel African Methodist Episcopal Church



Project Summary

Quinn Chapel African Methodist Episcopal Church is home to the oldest Black congregation in Chicago, with roots tracing back to the city's underground railroad. The church has been a community gathering place since its construction in 1891 and has hosted notable figures such as Susan B. Anthony and Dr. Martin Luther King Jr. At its inception, the house of worship was designed in a traditional gothic style and made of limestone. Due to this style and the age of the building, Quinn Chapel has consistently overheated in the summer months, causing parishioners extreme discomfort and sometimes deterring them from attending Sunday service in the auditorium. With temperatures inside the church sometimes reaching more than 80°F, chapel leadership sought a solution that would keep the building accessible to the community year-round.

As a part of the Commonwealth Edison (ComEd) Community of the Future Program, Slipstream partnered with ComEd to implement a restoration project at this historic church. The team initiated planning in 2021 and determined that an all-electric, high-efficiency variable refrigerant flow (VRF) heating and cooling system was the best option for the chapel as it addressed multiple cooling challenges within the auditorium, the age of the building, navigating the attic, and limiting penetrations in the tin ceiling. In 2023 the system was installed, and temperature and power analyses have been ongoing since then. The power analysis in the summer of 2023

showed the VRF units' power usage was limited because they were primarily used to control the temperature in the auditorium on Sundays. The temperature analysis showed that the new cooling units had a dramatic impact on keeping the building cool for parishioners during the summer months. With the installation of the VRF system, Quinn Chapel successfully balanced historical preservation with modern comfort, creating a space where tradition and innovation could come together to serve the community year-round.

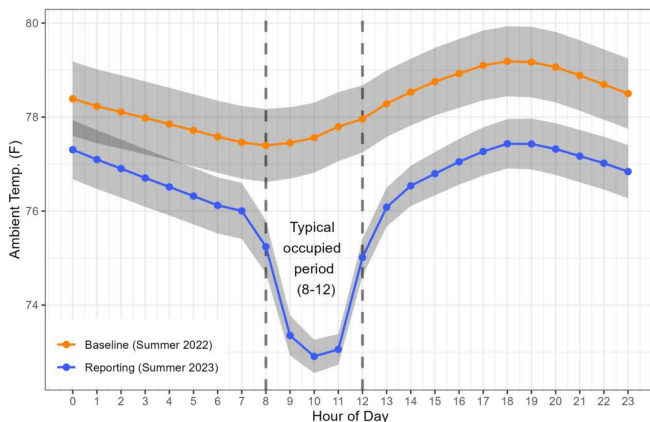
Project Snapshot

- 1 Installed an all-electric, high-efficiency VRF heating and cooling system.
- 2 Demonstrated the ability to successfully retrofit and install VRF in a historic, nearly 135-year-old building.
- 3 Reduced the building's temperature in summer months by an average of 6°F compared to previous summers.
- 4 Enabled the congregation to use the auditorium in all seasons, thereby increasing its capacity for community engagement.
- 5 Deployed a cloud-based alert system allowing service contractors to identify issues remotely and notify the owner when they need attention.
- 6 Expected to produce annual energy savings of 15% compared to a code-efficiency air conditioner.

Quinn Chapel

Project Analysis

To verify the effectiveness of this new technology, ComEd monitored the indoor temperature of the auditorium and the outdoor temperature at 10-minute intervals on Sundays when the church was open and the VRF system was in use. Before the upgrade, the indoor temperature often mirrored the outdoor heat, going beyond 78°F more than half of the time during services. After the installation of the VRF system, though, things improved dramatically—indoor temperatures were recorded at around 72°F during Sunday services. In fact, it was so cool inside the auditorium during the summer that Pastor Troy Venning mentioned some of the parishioners needed to bring shawls to keep warm.



Temperature of the Quinn Chapel Auditorium on Sundays in the summer of 2022, pre-VRF installation, and summer of 2023, post-VRF installation.

The Results

Overall, chapel leadership reported great satisfaction with the VRF system thus far. Though there is not yet one year of data, the interim report estimates the cooling savings will be 5,000 kWh and 3,100 therms every year over a minimum efficiency air conditioning system with their existing steam boiler. This means Quinn Chapel has reduced its utility costs by 15% by

choosing a VRF system as opposed to a more traditional air conditioning system. Pastor Troy Venning says that the system is easy to manage. One feature he likes is that it is connected to the cloud, so the service contractor notifies him if there is an issue with the system. Pastor Troy also expressed surprise at how low the utility bills have been since the VRF installation, which the church initially expected to be much higher. This reduction is likely due to the system's high efficiency and the church's practice of using it only as needed.

The Future

ComEd and Slipstream's support for the VRF system has allowed the church to continue its building upgrades and support the community. Because the church can use the auditorium for services and concerts year-round, leadership have transformed the lower level into a music space with new individual practice rooms. They also started construction of an underground railroad museum in the basement. This efficient and thoughtfully implemented system not only exceeded expectations in energy savings but also ensured that Quinn Chapel remains a sustainable, comfortable, and welcoming space for its community for years to come.



Quinn Chapel AME church celebrating their 128th June Rose Concert. On the left side of the picture is a new VRF cassette providing air conditioning during the concert.



Energy Efficiency

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