



Washington Memorial Chapel Valley Forge, PA

ABOUT In 2019, spurred by the need to upgrade the fire alarm system to current life safety code while preserving the historic building design and aesthetics, congregation leaders for the Washington Memorial Chapel reached out to Keystone Fire Protection Company, a KPI company, an authorized and certified Premier NOTIFIER Engineered Systems Distributor (ESD), to assess the fire safety of their historic structure. The renowned Washington Memorial Chapel (built 1917-21) serves as a national memorial to George Washington, and is an active parish in Valley Forge, PA. The chapel, listed in the National Register of Historic Places, features four-foot thick brick walls, beautiful internal wood carvings, Hamilton stained glass windows, sculptures, stonework and more. In addition to the chapel, there are two sub floor basements and a 102 foot bell tower.

With the historical society's approval for funding based on NFPA 914 for historical structures and the coincidental timing of the tragic Notre Dame Cathedral fire, chapel officials tasked Keystone Fire Protection with auditing and upgrading their existing fire alarm system to exceed IBC 2015, IFC 2015 and NFPA 72 life safety codes. This would require a complete replacement of the existing equipment with a comprehensive network of smoke detectors and audiovisual equipment to comply with NFPA 914 standards for historical structures.

CHALLENGE The key challenge lay in the robust construction and historic nature of the chapel. The brick walls were four feet thick, and the multi-level building included large fluctuations between grades and stories. The team had to piece together the building's structural layout from the latest blue print drawings completed in 1963. Keystone Fire Protection needed to design and install a fire and life safety system that would initiate and notify without damaging or interfering with the historic architectural elements and religious artwork.

The second challenge stemmed from the client requirement to "meet and exceed" code, and to go above and beyond to install a complete automatic smoke detection system without wiring.



This was a very unique installation, and the first fully wireless SWIFT installation of its kind.

Jim Arizini,
VP Alarm Construction,
Keystone Fire Protection



SOLUTION

An ONYX® Series NFS2-320 fire alarm control panel (FACP) was selected to provide comprehensive fire safety coverage with minimal installation requirements. SWIFT wireless gateways and smoke detectors were coupled with SWIFT wireless A/V bases to create a comprehensive fire detection network. This solution provided:

- > A state-of-the-art, seamlessly integrated fire safety system
- > 100% wireless initiation and notification devices
- > Maximum smoke detection with minimal disruption of historic structure
- > Surpassed code requirements for automatic smoke detection system
- > Superior service from best-in-class local distributor

WIRELESS AUDIOVISUAL DEVICES

Keystone Fire Protection opted for a comprehensive, fully wireless SWIFT fire detection system. SWIFT wireless technology is a Class A fire detection system that utilizes a robust wireless mesh network to ensure uninterrupted detection, and integrates with existing NOTIFIER ONYX series panels and wired NOTIFIER devices. Keystone coupled the SWIFT detectors with SWIFT A/V bases, allowing both initiating and notification

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devices to be completely wireless for maximum fire detection with minimal invasion to the chapel's walls and artwork.

DECIPHERING HISTORIC BLUEPRINTS

To design and configure the wireless detection and notification system, Keystone's design team had to execute extensive building surveys. Facilities managers had only pieces of the original blue print drawings from 1963, which required Keystone to create new CAD drawings utilizing the actual building measurements. In doing so, they discovered fluctuations between grades, stories, and uncovered unknown areas of the building. "Some of the 4ft thick walls twisted and turned in such a way that they were both exterior and interior walls. We had to figure out how to get wireless signals through them," states Jim Arizini, Keystone Fire Protection, VP Alarm Construction. "In some areas we had to place devices to cascade signals through doorways. SWIFT allowed us to do that," he continues.

FIRST INSTALLATION OF SWIFT IN BELL TOWER

Keystone Fire Protection placed the NOTIFIER NFS2-320 fire alarm panel in the basement, 4 SWIFT gateways around the building for maximum signal strength,

and 110 addressable SWIFT wireless detectors, notification appliances and gateways throughout the chapel, subfloors and bell tower. Since Chapel officials were very sensitive to mounting any equipment to walls, Keystone used small wooden mounts that matched the interior of the building. The fire alarm annunciator was placed by the main chapel entrance. "This was a significant upgrade," states Steve Hirsch, Project Manager. "Because these devices have their own individual addresses, first responders know exactly where within the chapel the fire is located. This is tremendously important in saving time and protecting these priceless artifacts," he continues.

INVISIBLE YET COMPREHENSIVE PROTECTION

Once installation of the robust fire safety system was in place, it was virtually invisible. Keystone Fire Protection exceeded challenging code requirements, without compromising the Chapel's 'Historic Places' listing. "If we had not had SWIFT, this would have been impossible to accomplish. NOTIFIER SWIFT allowed us to put in the right amount of protection needed, without cutting back because of installation challenges," remarks Jim Arizini. "We were able to preserve the beauty and nature of this important memorial while maximizing public safety." he concludes.

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