

Campus Fire Protection: University of Notre Dame's "Golden Dome" Standard



Reliable®

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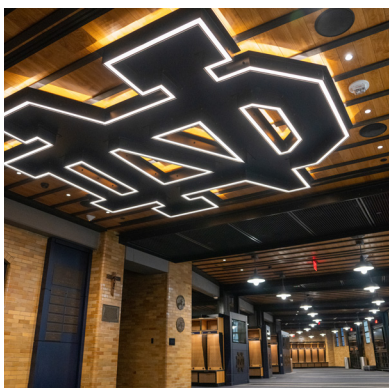
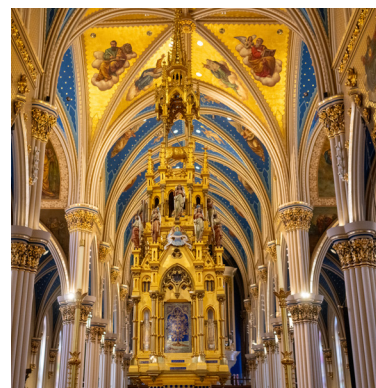
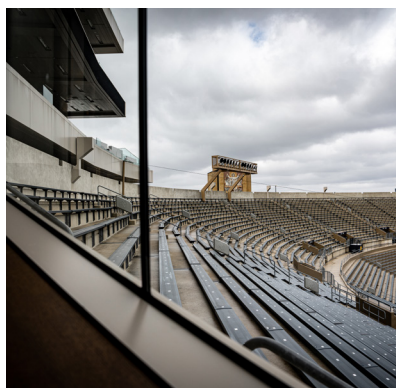
Nicholas Kavach and Matt Kovach of the Notre Dame Fire Department (NDFD)

Servant Leadership was the phrase we heard echoed—again and again—as we traveled across the University of Notre Dame campus. We interviewed over 15 of the university's Campus Life Safety team, from Vice President Mike Seamon to the individual firefighters and sprinkler technicians, and the message was consistent: Servant Leadership. These are not words, but a credo by which the campus safety professionals live and breathe.

The University of Notre Dame is a city within a city. Situated in the north South Bend Indiana metropolitan area, Notre Dame occupies 1265 acres, 185 buildings with 11 million square feet of space, its own power plant, police force, and professional fire department. The population ranges from 12,000 students, faculty and administration and swells to over 100,000 on game or event days. Students and structures are protected by virtually every type of fire protection systems, ranging from traditional wet pipe sprinkler systems in classrooms to deluge systems in high hazard areas.



Mary Weigle, Sr. Admin and Chief Bruce Harrison of the NDFD



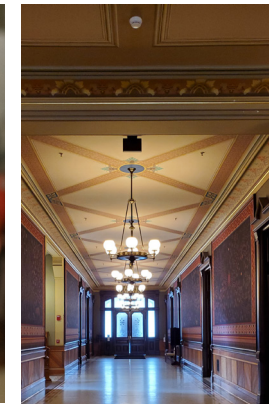
Aerial view over Snite Research Center in the Visual Arts, Notre Dame Stadium, Basilica of the Sacred Heart, Notre Dame Team Lockers—"The Gug"

The partnership between the University of Notre Dame Fire Department, Ryan Fire Protection, and The Reliable Automatic Sprinkler Co. has built a sterling fire loss record, the envy of campuses worldwide. The fully staffed, on-campus professional fire department ensures fast emergency response times, and the vigilance of NDFD's service technicians ensures correct operation of the campus's myriad fire protection systems.

And critical to its mission of ensuring the safety of all, the University of Notre Dame is one of five United States campuses with a dedicated 24/7 Fire Department. "The Notre Dame Fire Department is the first and oldest in the country," noted NDFD Chief Bruce Harrison.



Dwight Niles, Lead Technician of the NDFD monitoring the campus sprinkler systems



Fire Protection in The Main Building



Don Niles, Service Technician, Ryan Fire Protection

Founding of the University and the development of its fire protection infrastructure.



Rev. Edward Sorin



Father John Zahm

The University dates to 1842 when it was founded by French priest Fr. Edward Sorin. Like many institutions founded on the American frontier in the 1800s, Notre Dame was no stranger to fire tragedies. According to historian and author of The University of Notre Dame: A History, Rev. Thomas Blantz, C.S.C. noted that fires occurred "about every two years" in the early years of Notre Dame's history. The earliest fire protection charter was recorded in 1846: "to procure buckets, axes and other tools during a fire."¹

The most significant fire event happened in 1879, when unattended hot tar started a roof fire on the Main Building,



The Great Fire of 1879 at the Main Building, before and after



completely destroying the structure. "At the time, this represented the majority of the entire campus," he observed. After rebuilding, Father John Zahm was commissioned to start a fire department.



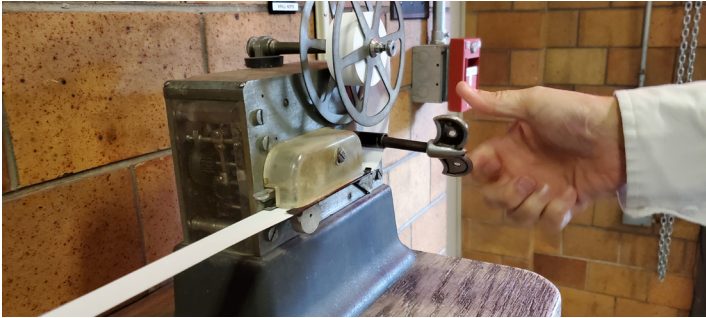
Circa 1900s early student volunteers, Brother Borromeo made fire chief in 1939 and modernized the department, early firetrucks outfitted by Brother Borromeo

The young institution responded and adapted to these events, beginning with a student/faculty bucket brigade team, the creation of a volunteer fire department manned by Brothers of Holy Cross (1911), and its first motorized fire response vehicle. In 1945, a generous donation from an alum built NDFD’s current firehouse. Since then, the department has evolved from the Brother staffed department, to a student volunteer department, to today’s all-professional department. “The enhanced capabilities of a professional department improved both the fire department and introduced dedicated EMTs to the staff,” Blantz concluded. Today the Notre Dame Fire Department employs sixteen full time firefighters, two fire protection technicians, and administrative support. They provide 24/7, 365-day service to the University.

Campus Fire Safety today.

“Our fire loss over the past 15 years has been smaller than the value of a SUV”, noted Chief Bruce Harrison. “This is no accident,” he continued. “It’s how we build our buildings – with sprinklers; our maintenance of our alarm and early detection systems; and instilled in our very consciousness of how the university operations and protecting what matters most.”

The fire in 2000 at Seton Hall University in South Orange, NJ claimed the lives of three freshmen and injured over 50 additional students.² “This tragedy renewed many campuses’ efforts – including Notre Dame - to accelerate the adoption of fire sprinkler systems in student residence halls,” Chief Harrison continued. Today, over 97% of the campus’s structures are protected by fire sprinklers. A close partnership between the NDFD, Ryan Fire Protection, and Reliable Sprinkler ensures that each new structure is protected, and service to existing systems is conducted with minimal disruption to academic and student life.



Asst. Chief, Tim Hoepfner stands next to the Gamewell Masterbox system—still in use along with the most modern alarm systems.



Residential retrofit in the fire station using CPVC pipe protects sleeping firefighters.

Types of Protection on Campus.

As a self-contained city, the University of Notre Dame uses virtually every type of fire protection system. Approximately 1650 fire protection valves control the protection of the campus’s 11 million square feet.

Wet Pipe Sprinkler Systems are the most common types of sprinkler systems. Water is in the system piping and available at the sprinkler. When the sprinkler fuses (operates) from exposure to a heat source, water flows from only sprinklers that have activated. 95% of Notre Dame’s sprinkler systems are wet pipe. Student housing, classrooms, administration buildings, dining facilities are all protected by wet pipe systems.

Commercial wet pipe systems generally use spray sprinklers, which discharge water in a hemispherical area onto the floor below. These systems are designed to protect the structure by controlling a fire and allowing safe evacuation from a structure. This allows time for the fire department to extinguish the fire or ensure the fire has been extinguished by the sprinkler system.

Residential wet pipe systems are life safety systems. Unlike spray sprinklers, residential sprinklers have a high spray pattern, intended to wet and cool walls. Although residential systems often extinguish a fire, they are designed to allow occupants time to safely evacuate a structure.

Dry Pipe Sprinkler Systems are used to protect areas that are subject to freezing temperatures. System piping is pressurized by compressed air or nitrogen, which holds a control valve closed. Upon activation of a sprinkler, pressure drops in the system piping, allowing the valve to open and flow water through any activated sprinklers.

Northern Indiana gets cold! Many areas at Notre Dame that are exposed to the elements are protected with dry pipe systems: walk-in freezers, loading docks, and other areas subject to cold temperatures are just a few areas that use these systems.



Examples of campus fire protection includes wet fire sprinklers, deluge systems, and addressable fire alarm control units.

Preaction Systems are sprinkler systems used in areas where accidental water discharge is unacceptable. Like a dry pipe system, there is no water present in the system piping. Unlike a dry system, one or two signals are required before water flows into the system piping. For example, both the activation of a heat/smoke/flame detector AND the activation of a sprinkler are required before the system operations.

Computer and telecommunication areas at the university use preaction systems. In areas where a neat appearance and quiet operation are required, steel cabinet-enclosed preaction systems like the Reliable PrePaK™ are used.

Deluge Systems are fire protection systems that employ a series of open nozzles – not closed fire sprinklers – that are controlled by a system valve. When the valve trips, water flows from all nozzles. Deluge systems are used for hazardous areas where fire has the potential to spread rapidly, effectively “outrunning” a closed sprinkler system. At Notre Dame, deluge systems protect the Golden Dome of the Main Building and the bell tower.

Clean Agent Systems are gaseous systems used to suppress fire in enclosed, water-sensitive areas such as the protection of critical electronic equipment and protection of historic artifacts. In many cases they are used in conjunction with double interlock preaction systems. Clean agent systems on campus include the Hammes Mowbray Hall (emergency dispatch), Risk Management and Safety (RMS), and a nitrogen mist system protecting underground fuel storage at O’Neill Family Hall.

System Maintenance and Monitoring: Regular maintenance and monitoring of these systems are critical to their effectiveness. Nicholas and Matthew Kovach, fire alarm technicians at Notre Dame, describe their role in ensuring these systems function optimally: “We start most days with a scheduled system inspection, and are then responsible for troubleshooting any of the campus’s hundreds of systems,” noted Matt Kovach. “And we have to be diligent of class schedules and student activities,” he continued. “We want to ensure to minimize disruption to the academics.”

Conclusion:

The University of Notre Dame’s approach to fire protection shows a mix of history, innovation, and servant leadership. The nation’s first campus-based fire department was established in the aftermath of a devastating fire. Today, the school continues to evolve to meet the challenges of protecting a diverse and dynamic campus. This makes Notre Dame a model for protecting campus from fire.



Dry Pipe Valve in Basilica Basement (top), PrePaK (middle), Deluge Systems protect the Golden Dome and bell tower (bottom)



To a person, the administrators, fire protection and security professionals with whom we spoke espoused the value of servant leadership and took their collective mission seriously. In the words of essayist Robert K. Greenleaf, “The servant-leader is servant first...It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead.”³

The marriage of this philosophy with a proactive approach to fire safety has earned Notre Dame’s reputation as a fire safe campus, whether it a academic day with a population of 9,000...or game day with a population of 100,000.

“When a parent entrusts their son or daughter to our care, our commitment is to keep them safe from all harm”, concluded Vice President University Operations, Events, and Safety Mike Seamon.



About the authors:

Jennifer Kouyoumjian is the Visual Communications Manager at Reliable. With over 30 years of experience, she blends her expertise in technology, engineering, manufacturing, and creative advertising with a passion for visual storytelling and journalistic-style communication.

John Corcoran is Reliable’s Marketing Director. He has been active in the fire sprinkler industry since 1992, working in manufacturing and contracting firms in marketing and commercial operations roles.

1. Notre Dame Fire Department – 130 Years, University of Notre Dame Press.
2. Allen, C. D., (2000), A Review of the Seton Hall University Fire Tragedy of January 2000, <https://reslife.net/hp/a-review-of-the-seton-hall-university-fire-tragedy-of-january-2000/>
3. Greenleaf, Robert K., (1970) The Servant as Leader, 1970, Robert K. Greenleaf

