

Fallingwater

📍 MILL RUN, PA

Photo courtesy of Western Pennsylvania Conservancy

Siplast Products Used:

Waterproofing Solutions

- Teranap® Waterproofing Membrane

PMMA Liquid Flashing System

- Parapro®
- ProColor PMMA matte finishes

Project at a Glance:

Project: Fallingwater

Location: 1491 Mill Run Rd, Mill Run, PA 15464

Date of Completion: 2026

Project Team:

Ownership: Western Pennsylvania Conservancy (WPC)

Architect: Architectural Preservation Studio, DPC

Engineer: Matteo Ferran, Structural Engineers, PLLC

Contractor: Allegheny Roofing & Sheet Metal Co., Inc.

The Challenge:

Tucked into the lush Laurel Highlands of southwestern Pennsylvania, Fallingwater is one of the most beloved works of American architecture. Designed by Frank Lloyd Wright in 1935 for prominent department store owners, the house served as a peaceful weekend retreat. The house was placed directly over the waterfall, rather than simply offering a view of it. This bold move reflected the belief that a building should exist in harmony with its surroundings. With its cantilevered terraces, locally quarried stone, and sweeping views, the house is situated as an extension of the landscape.

Fallingwater is admired for its seamless blend of art, nature, and design innovation. In 1963, the home was donated to the Western Pennsylvania Conservancy, which opened it

to the public. Today, visitors from around the world come to experience the house and its serene setting. In 2019, Fallingwater was honored with the designation as a UNESCO World Heritage Site.

The home's organic design placed it directly over moving water, creating a deliberate physical connection between the structure and its surroundings. Even its name conjures the constant presence of cascading water. Yet behind its breathtaking beauty lies a poetic irony: the very element that defines it — water — has also created many challenges for the structure.

The house's sweeping terraces, rounded edges, minimal drainage, and flashing have made it vulnerable to water infiltration, especially through its stone walls and along its curved edges, where moisture can run back toward critical transitions, such as windows and doors. The result is a historic site in need of waterproofing solutions that support the physical restoration and long-term preservation of the property — key necessities for it to retain its World Heritage designation. The elimination of traditional room enclosures and emphasis on open indoor-outdoor spaces increased exposure to the elements.

Fallingwater's ribbon windows — some of which also concealed structural elements — cantilevered balconies, and porous transitions did not use conventional waterproofing, eventually resulting in moisture related issues.

Further complicating matters, the use of natural materials with the site's existing topography meant that Fallingwater was not merely placed on the landscape — it was of the landscape. Built from native sandstone and positioned around existing rock formations, the house required roofing and waterproofing solutions that accommodated irregular shapes and geometries while maintaining the appearance of the original design.

Areas behind the stonework that were originally filled with rubble during construction have settled over its ninety-year lifespan, creating hidden voids that create paths for water to collect and seep inward. This ongoing infiltration now threatens the interior finishes and original design elements, making discreet, high-performance waterproofing both an urgent and sensitive undertaking.

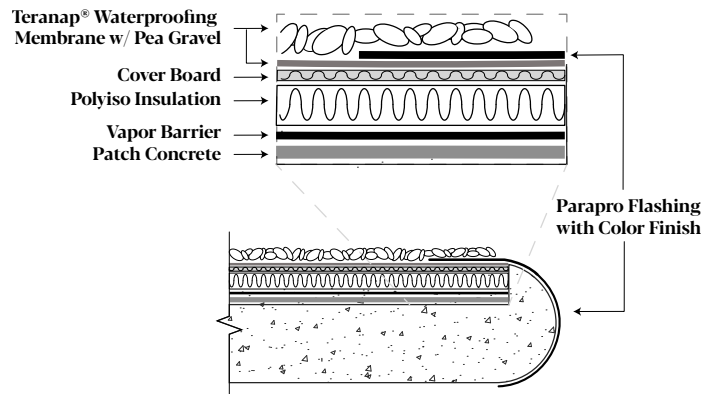
The Solution:

As part of a \$7-million effort to address water infiltration issues, the Western Pennsylvania Conservancy enlisted New York City based Architectural Preservation Studio (APS). Having collaborated with Siplast on previous projects, APS once again specified Siplast to use current materials and develop solutions for complex roofing and waterproofing challenges.



Photo courtesy of Western Pennsylvania Conservancy

This team spearheaded an exhaustive study of the building's failures, documenting issues such as aging materials that have left the structure increasingly vulnerable to water infiltration. Matteo Ferran Structural Engineers and Pittsburgh-based Allegheny Roofing & Sheet Metal Co., a Siplast Select Contractor, translated preservation options into practical



applications, carefully navigating the building's irregular geometry and integrating the new system without compromising the integrity of the design.

Throughout the process, field investigations revealed extensive voids within the stone walls and cracks in the concrete parapets, requiring highly specialized interventions. The team employed non-polymer-modified concrete repair mortar to help maintain compatibility with the original materials as well as with the fluid-applied flashing system, while coping stones were carefully reset on through-flashing and stone walls were grouted to fill voids.

Additionally, the team addressed moisture vulnerabilities at the iconic stone chimney by grouting, removing 1980s-era lead flashing, and preparing for the installation of ventilated chimney caps designed to be both unobtrusive and functional.

The Parapro® PMMA Flashing System provided appropriate waterproofing and concrete protection on the bullnose edges of the roofs and terraces without sacrificing the visionary design intent. This helped prevent water from reversing into the structure by naturally forming a drip edge, guiding water down and away from the building, which previously created significant deterioration of both the concrete edges and steel window elements.

With a mandate to preserve the architectural authenticity and integrity of Fallingwater, the team approached every technical solution with care. The waterproofing strategy had to meet modern performance standards without disrupting the organic interplay of structure, stone, and stream that defines



this global icon. The Teranap® Waterproofing Membrane, a premium multi-ply SBS-modified bitumen waterproofing system, was selected for its proven performance. The new Teranap system provides the appropriate surface, even water distribution, and minimizes wear under aggregate.

Siplast also provided options for moisture mitigation within the concrete cantilevered slabs. These proven systems addressed the design team's concerns regarding moisture drive and appropriate membrane adhesion, which were identified during the initial forensic investigations conducted by APS. This modern technology, which was not available during the previous restoration, will now help ensure long-term durability and effective protection for the new waterproofing system.

The guest house at Fallingwater served as the testing ground for the entire system. In an iterative process, each material was validated for performance, thickness, and

compatibility with the historic structure. This collaboration ensured the solution was functional while sensitive to Fallingwater's original design intent. Following the successful implementation at the guest house, the same system is now being carefully applied to the main house, preserving the integrity of Wright's iconic design while addressing critical waterproofing needs.

Fallingwater is a contemporary approach to historic preservation, demonstrating how advanced modern materials, combined with thoughtful design, can help offer innovative solutions to age-old restoration challenges. Siplast has been a trusted partner — from early assessments to system design support and on-site implementation — bringing technical experience and innovative solutions to protect one of modern architecture's most iconic works.



UNITED STATES
14911 Quorum Dr.
STE. 600
Dallas, TX 75254
O: 469.995.2200

CANADA
201 Bewicke Ave., STE. 208
North Vancouver, BC,
Canada V7M 3M7
1.877.233.2338



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