



Case Study – Comparison of Conventional and SPF Roofing Systems The Experience at Texas A&M University

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The Problem and Potential Solution

In 1974, dissatisfied with performance of traditional tar and gravel built-up roofing (BUR) systems, the Physical Plant Department began looking for viable roofing alternatives. The BUR roofs were constantly leaking, and because of the nature of BUR, leak detection was virtually impossible.

As the Physical Plant Department began soliciting information from various roofing sources and checking references, sprayed polyurethane foam (SPF) roofs exhibited advantages that seemed to fit the criteria of the University. The Physical Plant Department found the following:

1. Seams are one of the major sources of leaks in roof systems and SPF roofs are totally seamless.
2. Water does not travel laterally in SPF roofs as it can in BUR or single-ply roofs. A leak in the top membrane of a BUR or single-ply roof will create the spreading of water, saturating the insulation and causing multiple interior leaks. With SPF, even if a hole is punched through the entire two-inch membrane, water movement will be restricted to the hole. In most cases repairs can be made with a tube of caulk.
3. Because the SPF roof is lightweight, permeable and fully adhered, normally an old roof does not need to be removed in order to apply a new one. If underlying areas of saturated insulation are found, minimal tear-off may be required.
4. The SPF roofing is less disruptive to students and faculty since tear-off is minimal. Also, projects are accomplished faster because the application is quieter, quicker and requires far less laborers.
5. Roof mounted units, penetrations, curbs, and parapets can receive a seamless monolithic application because SPF is spray applied. BUR and single-ply roofs require flashing materials with sealants which frequently result in leaks.



SPF Roofing Systems Case Study, Continued.

Giving SPF Roofing Systems a Test Run

In 1974-75, convinced the proceeding advantages warranted taking a look at this relatively new roofing system, the Physical Plant Department issued contracts for the reroofing of several buildings. One of the earliest roofs done with this system was Davis-Gary dorm. After seventeen years this roof has not leaked and requires minimal maintenance.

Between 1975 and 1977 the Physical Plant Department and TAMU Systems Facilities Planning and Construction (FPC) communicated back and forth concerning the monitoring of these roof installations. New BUR roofs were providing the University with service life of less than five years, and many of the BURs were leaking from the onset. In 1977 the Physical Plant Department foamed over a BUR application that was less than four years old. After monitoring the SPF installations, FPC was also convinced and since 1977, all new roof applications have used SPF roofs.

FPC received numerous complaints stemming from this decision. Few roofing contractors had the financial ability to mobilize spraying foam. Fewer still had the caliber of crews that chemically formulate foam in the field. Though this eliminated potential bidders, it in effect greatly elevated the caliber of roofing contractor performing work at Texas A&M.

Many outside architects working at the University were unfamiliar with the system, and some of these had a reluctance to learn anything new, but the Physical Plant and FPC were adamant. As time went by, architects and general contractors learned the many advantages of the system. This caused proliferation of the SPF Roof systems in surrounding school districts and Universities.

The Performance Record

Today over 7 million square feet of SPF roofing has been applied throughout the A&M system. With very few exceptions, these roofs are holding up extremely well. In fact, it is extremely rare that one of these roofs leaks at all. Blister defects, which occasionally occur, do not create leak problems. Most leak problems at our campus occur on the few buildings that still have BUR on them.

In 1985 the Physical Plant Department found another advantage in using SPF roofing systems. For a number of years, Mr. Gerald Scott, P.E. was in charge of roofing and energy conservation within the Physical Plant Department. Vendors of the SPF system always championed the energy saving characteristics of the system. We realized polyurethane was a most effective insulation, but our main concern had always been to prevent roof leaks.



SPF Roofing Systems Case Study, Continued.

Mr. Scott monitored energy savings on 27 different buildings that had received SPF roofs from 1980 to 1984. The results were astounding. TAMU was able to recover the complete cost of the roof application through energy savings in an average of four and one-half years.

Mr. Scott's Concluding Thoughts

Quoted here is Mr. Scott's conclusion, which is still shared by today's Physical Plant Department:

From the time of construction, and throughout the life of the roof, built-up roofs were major maintenance and repair items. The experience that the Texas A&M University Physical Plant gained since 1974, when they began, indicates that no major problem, and very few minor ones exist in the polyurethane roof systems. As a result of this experience, all new construction includes the foamed polyurethane roof system. To date some 16 new facilities have this roof system totaling nearly one million square feet.

Another major advantage in a SPF roof system that does not exist with any other roofing system, is that SPF is a renewable system. While BURs and singly-plys must be removed and replaced after their usable lives, SPF roofs can be repaired and recoated to offer an indefinite life expectancy. Coupled with the energy savings and reduction in in-house maintenance costs, the SPF roofing system maintains a tremendous long-term cost efficiency advantage over all other roofing systems. Without question, SPF roofs have a tremendous edge in preventing leaks and in detection and repair when one does occur.