

**A COMPARISON OF BUILT-UP
AND
FOAM ROOFING SYSTEMS**

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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 (SPUF) 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 SPUF roofs are totally seamless.
2. Water does not travel laterally in SPUF 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 SPUF, even 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 urethane caulk.
3. Because the SPUF 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 SPUF 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 SPUF is spray applied. BUR and single-ply roofs require flashing materials with sealants which frequently result in leaks.

In 1974-75, convinced the preceding 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 leading from the onset. In 1977 the Physical Plant Department foamed over a BUR application that was less than four years old. After monitoring the SPUF installations, FPC was also convinced and since 1977, all new roof applications have used SPUF 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 SPUF roof Systems in surrounding school districts and Universities.

Today over 7 million square feet of SPUF 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 of these defects are covered by warranty with no expense to the University. 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 SPUF 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 SPUF 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.

Mr. Scott monitored energy savings on 27 different buildings that had received SPUF roof 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.

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 SPUF roof system that does not exist with any other roofing system, is that SPUF is a renewable system. While BURs and single-plys must be removed and replaced after their usable lives, SPUF 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 SPUF roofing system maintains a tremendous long-term cost efficiency advantage over all other roofing systems. Without question SPUF roofs have a tremendous edge in preventing leaks and in detection and repair when one does occur.

The conclusion of today's Physical Plant Department has not varied from the conclusion reached by Gerald Scott in 1985. We at the Physical Plant Department continue to monitor the progress of other roofing systems available. But at this time, no other roofing system can offer the leak free service, the ease of leak detection and maintenance, the energy efficiency, durability, or renewability provided by sprayed polyurethane foam roofs.

ROOFING PROJECTS WARRANTY

Bldg. No.	Bldg. Name	Project No.	Account No.	Contractor	Warranty	No. Years	Effective Date
501	Industrial Tech	03-91-0165	803200	Slawson Roofing		5 yr	5/1/92
503	Industrial Tech	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	
506	Fine Arts	03-93-0231	804900		General Elec.	10 yr.	3/18/94
506	Fine Arts			Specified Urethane	Dow Corning	10 yr	10/28/92
507	Math	03-94-0052	815400	Specified Urethane			
508	Agriculture			Specified Urethane			
509	Science	03-95-0038	180200	South Tex. Urethane	Neogard	5 yr/1 yr STU	
511	Humanities	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr/1 yr	9/2/96
513	Education	03-95-0038	180200	South Tex. Urethane	Neogard	5 yr	
518	Physical Plant	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	9/2/96
522	Davis Hall	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr	9/2/96
525	Dining Hall	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	
525	Dining Hall	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	6/30/95
526	Gough Hall	03-94-0052	815400	Lon Smith & Assoc.		2 yr/25 Sh	3/1/95
530	Moody Hall	03-94-0052	815400	Lon Smith & Assoc.		2 yr/25 Sh	3/1/95
533	Tarleton Center			Lon Smith & Assoc.		2 yr/25 Sh	3/1/95
533	Tarleton Center	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	6/30/95
534	Administration	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr	9/2/96
534	Administration	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	6/30/95
536	Bender Hall	03-94-0052	815400	Lon Smith & Assoc.		2 yr/25 Sh	3/1/95
537	Press Box	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	6/30/95
551	PE Field Facility			Crawford Roofing	Futura	10 yr	8/2/89
646	Coed Dorm	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	
647	Dorm Lounge	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	
648	Wisdom Gym Pool	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	9/2/96
648	Wisdom Gym E.	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	9/2/96
648	Wisdom Gym			Specified Urethane	Dow Corning	10 yr	10/28/92
649	Crockett Hall			Specified Urethane	Dow Corning	5 yr	6/30/95
649	Crockett Hall	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	6/30/95
656	Library	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	
656	Library			Specified Urethane	Dow Corning	5 yr	6/30/95
663	Ferguson Hall	03-94-0052	815400	Lon Smith & Assoc.		2yr/25Shi	3/1/95
671	Ag Engineering	03-95-0038	180200	South Tex. Urethane	Neogard	5 yr/1 yr STU	

673	Farm Machinery	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	
716	Teaching Pavillion	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	9/2/96
717	Meats Lab	03-93-0231	804900	Specified Urethane	General Elec.	10 yr.	3/18/94
728	Ag. Mech. Lab	03-95-0038	180200	South Tex. Urethane	Neogard	10 yr.	9/2/96
810	Venture Apts.	03-94-0052	815400	Lon Smith & Assoc.		2 yr/25 Sh	3/1/95
818	Plowboy Apts.	03-94-0052	815400	Lon Smith & Assoc.		2 yr/25 Sh	3/1/95
882	Summit Apts.	03-94-0052	815400	Specified Urethane	Dow Corning	5 yr	6/30/95