

SPRAY POLYURETHANE FOAM ALLIANCE

SPFA

NATIONAL
INDUSTRY
EXCELLENCE
AWARDS
2012

HUGE SPF PROJECT
HELPS FAMILY BUSINESS
MAINTAIN COMPETITIVE
POSITION BRINGING

CHICKENS

SPFA 2012 NATIONAL CONTRACTOR EXCELLENCE AWARD WINNING PROJECT (ROOF SPF >40,000 SQ FT)

Congratulations to West Roofing Systems, winner of the 2012 Annual SPFA National Contractor Excellence Award for Roofing SPF Over 40,000 Square Feet. These projects are examples of SPF's performance, applicability and appeal, in this case to a commercial chicken farm with a huge and complicated roof. Winners of the SPFA Award must submit their projects and have them judged best-in-class by a panel of construction industry leaders.

With over 400,000 chickens being processed daily, Fieldale Farms has a big operation to maintain. One of their major operating costs identified was energy expense. They needed to reduce their energy consumption, thereby reducing the processing cost per chicken to keep their prices competitive. Otherwise Fieldale was looking at a potential relocation of its operations to outside the United States. Determined to do what was needed to keep the family business employing Georgians, this high-tech facility made the choice to go with SPF.

THE PROBLEMS

Trouble spots with the existing facility included numerous leaks with constant maintenance and repairs being performed almost on a daily basis, very poor insulation in the existing roof assemblies wasting significant energy to maintain the extreme interior ambient conditions throughout the facility, and a massive negative pressure problem within the building also contributing to the high energy consumption. This resulted in roughly \$1.5 in annual energy costs for Fieldale.

The complicated facility has 120,000 square feet of roofing with 26 different roof sections varying in age from 5 years to 34 years old. "To date, we have only seen a couple of facilities with this extreme amount of roof top equipment and process lines. The roof is very busy with penetrations, process line support

stanchions, and mechanical systems that require daily maintenance presenting a major waterproofing concern," said Jack Moore, project engineer at West Roofing Systems. "This provided the SPF roof a competitive advantage with the self-flashing ability of the system."

OPERATIONAL CONSIDERATIONS

The facility introduces truckloads of fresh chickens at one end, which exit the other end of the building predominately frozen. Processing of the chickens takes place under the 26 roof areas with varying existing roof assemblies. Additionally, the interior space did not correlate to the roof top area separations requiring new area dividers to be installed, which also affected the drainage patterns. And with employees from the USDA stationed at the facility

on a daily basis, providing a leak-free condition was of paramount importance. If the building leaked into controlled areas the plant could be shut down, risking the owner financial losses, missed deadlines, and possible loss of customers.

THE BEGINNING OF THE FIX

Fieldale brought in multiple Energy Service Companies (ESCO) to propose solutions to their high energy consumption. Ultimately, Fieldale contracted with Trane, US to perform an Energy Savings Performance Contract (ESPC). Trane worked with West Roofing Systems to do an initial investigation to ascertain if the system and construction practices could aid in the ESPC.

"We had to meet with Trane's engineers and the facilities operating personnel to design each roof area to



TO MARKET

perform with all of the varying conditions. Almost each roof area required a different R-value, which also had to be designed to accommodate the new drainage patterns. The vapor barrier design was twofold. We addressed the interior to exterior drive by installing Grace UltraShield II self-adhering membrane directly over the new 1/2 DensDeck that was adhered to the metal roof deck, eliminating thermal drift through mechanical fasteners. This also required the use of polyester reinforced butyl backed tape and butyl sealants to address the numerous penetrations that could not be sealed with the vapor barrier membrane," said Moore.

The exterior to interior vapor drive was addressed with a fluid-applied vapor barrier installed directly over the SPF at 30 mils thick. All of these areas were designed to provide the maximum energy efficient roof assembly, which the Trane engineers plugged into their modeling calculations providing verifiable performance paybacks. This allowed the new SPF roof system to



be included in the ESPC, providing the owner with financial flexibility by not requiring an initial major capital investment for the roof installation. Instead it provided long term financing options, including tax credits provided by the local energy supplier.

WHAT'S MORE...

The other priority concern of the ESPC and the mechanical improvements dealt with the negative pressure experienced inside the facility. Opening the

main doors to the facility was tough due to the extreme negative pressure. Trane addressed this condition by improving controls and creating zones within the facility. One last problem was the loss of air pressure through the building envelope, primarily identified through the roof deck as the building walls were constructed of masonry and pre-cast concrete. The SPF system was able to provide a monolithic blanket of insulation over the entire structure creating an air barrier which allowed

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the mechanical engineers to properly design control zones, eliminating the negative pressure concern. SPF was also utilized at through-wall penetrations and many of the building's roof-to-walls transitions to seal these areas of leakage.

THE DETAILS

West Roofing installed all of these roof solutions using the WDG System 14 product line. The SPF application varied from a minimum of 1.5" to 7" thick of WDG 3009-3 spray polyurethane foam. The applicators installed a base coat of 15 mils of WDG HSS 540 R2R Silicone Roof Coating containing 15% recycled EPDM roof content and a top coat of 15 mils of WDG HSS 540 R2R Silicone Roof Coating with 3M Ceramic Granules embedded into the top coat. The coolers and freezers received an additional application of 30 mils

of fluid applied vapor barrier prior to the installation of the silicone coatings.

Due to the "working roof" nature of the facility, West installed 4,000 square feet of WDG Zguard Pedestrian Traffic system to increase the durability of the route in critical areas. 58,000 square feet was installed as an overlay to an existing gravel-surface BUR after the gravel

was wet-vacuumed from the roof surface, 35,000 square feet was installed as an overlay to an existing granulated modified bitumen roof system after being properly cleaned, and the balance of the 27,000 square feet required complete removal prior to re-roofing as it was saturated. In all cases an infrared inspection was performed.

This area was predominately over the freezer/cooler space that averaged 10" thick of existing roof membrane and insulation. All of this work had to be performed while the plant was in full production and while maintaining a sanitized environment. Even the slightest amount of dust or debris falling from the roof deck could contaminate the product, requiring shut down and cleaning. West had to employ numerous means of containment within the occupied space to satisfy the USDA to allow the owner to maintain production throughout all of this activity.

Upon project completion the owner was issued a 20 year full-system manufacturer's warranty. Trane, US continues to monitor the energy performance of the facility and all of the initial observations are positive towards the initial design performance expectations. The Fieldale personnel are "amazed" at the difference in control of the interior ambient temperature and being able to maintain a constant temperature. In the past the temperature swings could be very substantial throughout the day. The Trane engineers contribute much of this performance to the R-value and air barrier control provided by the new SPF roof system.

Richard West, president of West Roofing Systems, concluded, "Sure, we're talking about chickens. But this business maintains one of the highest performing facilities of its type in the world. Fieldale Farms commits to exceptional best practices when it comes to their chickens, including an American Humane Certified environment, use of 100 percent vegetarian feed of American grown corn and soy, uses no antibiotics and no growth hormones. They pay attention to detail and do it right – what other kind of roofing system would you expect them to choose if not SPF?" ○

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Since 1979 West Roofing Systems, Inc. has installed over 60 million square feet of commercial and industrial SPF roofing. Universities, Hospitals, government buildings, retail, and industrial buildings, as well as military facilities illustrate the variety of architecture and projects in their portfolio. West provides complete building envelope solutions utilizing state of the art technologies combined with time tested materials providing complete turnkey building waterproofing solutions.