

FleeceBACK® TPO
Roofing Systems

CASE STUDY

Enhanced Wind and Hail Protection with FleeceBACK TPO at Lubbock County Law Enforcement Center



JOB PROFILE

PROJECT LOCATION:
Lubbock, Texas

CARLISLE APPLICATOR:
Schrader Roofing Company of Lubbock

BUILDING OWNER:
Lubbock County, Texas

ROOFING SYSTEM:

- » 115-mil white FleeceBACK TPO
- » 60-mil tan Sure-Weld® TPO
- » Flexible FAST™ Adhesive
- » Sure-Weld TPO Bonding Adhesive



The Lubbock, Texas, County Law Enforcement Center is a 120,000-square-foot complex that spans nearly a full city block and is home to a wide range of law enforcement departments and activities, including the local sheriff's office, 911 call center, communications center, training rooms, evidence storage area, and much more.

When it was time to replace the 69,100-square-foot roof on the complex, it was important to install a roofing system that would not only perform well in the hot Texas climate but would also withstand the punishing hail and severe weather systems that are frequent in this part of the country.

For the new roofing work, they turned to Schrader Roofing Company of Lubbock, a contractor with extensive experience across the South Plains and in eastern New Mexico.

“We were very excited about winning this challenging project,” said Robbie Sanders, Project Manager for Schrader Roofing. “The existing roof was a total disaster and leaking badly. There was an original gravel surface built-up roof that had been re-covered with spray-foam which had lots of bubbles and blisters, and the entire thing was covered with a gravel surface to protect the spray foam system from hail damage.”

The multi-level roof is divided into several sections. There are four sections on the single-level portion of the structure, all at different levels. The largest section of the roof is over the main, multi-story portion of the facility, which was once a large jail. The roof over the larger half is divided into three sections. A knee wall divides the main roof in half, and another knee wall running perpendicular to the first, divides one of the halves into two sections.

Each of the three sections of the higher roof includes a large opening to the floor below, surrounded by a 6-foot wall, with chain link fencing across the top. The openings were originally designed to provide light and fresh air to the recreational yards for the inmates who inhabited the facility.

In addition to these structures, the roof was littered with dozens of abandoned internal drains, vent stacks, and small mechanical curbs, originally for the jail below, that were simply covered over with the spray-foam roof and left protruding through the gravel surface.

“The tear-off was definitely the most challenging aspect of this project,” said Sanders. “Our team had to remove the gravel, the spray foam roof, as well as the built-up roof and insulation below it, all the way down to the concrete deck. In total, we hauled 90 tractor-trailer loads of gravel and old roofing materials off the roof and away from the jobsite.”

The Schrader team, which ranged in size from 12 to 15, had to hand-shovel the gravel off the roof, since vacuuming was not an option due to the size of the roof and its accessibility from the ground. Once that monumental task was complete, the team had to cut out and remove the various layers of old roofing material, which were hauled to one of two trash chutes and sent to dumpsters on the ground below.

“The crew really worked hard to clear that roof,” said Sanders. “It was very labor-intensive, but we were able to get it done.”

Schrader Roofing had suggested installing a lightweight insulating concrete system for its ability to provide excellent slope-to-drain on this project.

Once the concrete deck was cleaned of the old materials, the team from Schrader installed a self-adhered modified base ply directly to the deck, which served as both a vapor barrier and helped to keep the facility watertight during the re-roofing process.



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“We install a lot of FleeceBACK membrane for the **added wind protection and hail- and puncture-resistance** it provides.”

“The underlayment was critical,” said Sanders, “since Lubbock experienced an unusually heavy amount of rain during the time we were installing the roof. We had to make sure the building remained watertight throughout the project.”

Once the deck was stripped clean and the vapor barrier applied, the Schrader team hired a lightweight decking contractor to install a slurry coat of lightweight insulating concrete over the deck. Next, they placed the 2-ft. x 4-ft. expanded polystyrene insulation (EPS) boards into the slurry in a brick pattern with 1-inch stair-step increases to create the proper slope for drainage. The EPS installed ranged from 8- to 38-inches thick to ensure that the roof met the R-25 value specified.

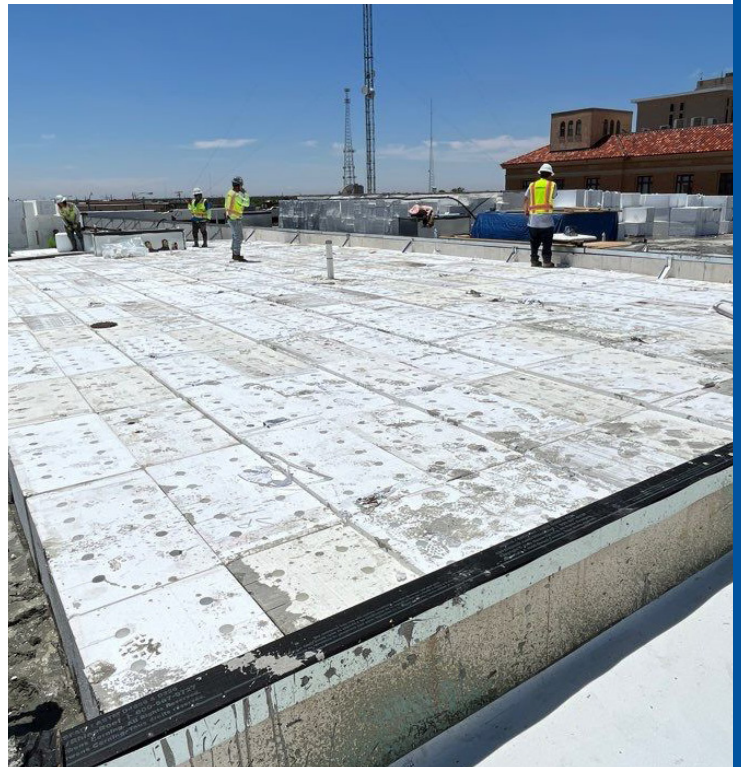
The last step in preparing the roof deck for the membrane was installing a topcoat of the insulating concrete over the entire section of the roof, leaving at least two inches of concrete over the top.

The New Roofing System

“The lightweight deck was a great option for this project,” said Sanders, “and enabled us to install a great new substrate that sloped properly to the scuppers. In addition, the thickness of the new lightweight deck allowed us to eliminate most of the curbs and vent stacks that littered the old roof, although we did leave a few of the larger unused HVAC curbs in place for possible future expansion.”

The new roof specified was a 115-mil Carlisle FleeceBACK TPO membrane, 12-feet wide. The membrane features Carlisle’s exclusive Octaguard XT™ weathering technology, which is designed to withstand severe climates like the one in Lubbock, Texas. And with 33% greater puncture resistance compared to 60-mil TPO membranes, it also provides excellent resistance to hail, which is common in this area.

“We install a lot of FleeceBACK membrane,” said Sanders. “For this project, it was the only real option given the lightweight deck, but we also like it for the added wind protection and hail- and



puncture-resistance it provides, both of which are important in this part of the country.”

The membrane was fully adhered to the new lightweight deck using Carlisle Flexible FAST Adhesive, a two-part polyurethane adhesive, using a Patriot Jr. applicator and 15-gallon drums. The Rig Splatter application method for Flexible FAST can provide up to 55% more coverage than traditional 4-inch beads for superb wind performance.

The adhesive was sprayed directly onto the new roof deck, and then the fleece membrane was rolled into the adhesive, brushed down and rolled in with a weighted roller for maximum contact.

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For the parapet walls, which were nearly 4-foot-tall on the upper roof, Schrader's crew installed 60-mil tan Sure-Weld TPO membrane which was adhered directly to the walls using Sure-Weld TPO Bonding Adhesive. The same tan membrane was bonded to the 6-foot-tall walls surrounding the openings for the old recreational yards. For those walls, the membrane was welded to the field sheet at the bottom of the wall. An 'envelope' term bar was installed at the mid-point on the wall to secure the top and bottom sheets of membrane. The top sheet was then flipped up and over the termination bar, adhered to the wall, and terminated at the top of the wall with another term bar. On the lower knee walls, the tan membrane was run up and over in both directions and welded to the field sheet, providing two layers of membrane over the expansion joints for added protection.

"The roof is visible from the local interstate, so we used tan membrane for the aesthetics it offers, plus it does not reflect back into the field sheet the way that white membrane sometimes does," said Sanders. "I think it's a much nicer look overall."

Due to the excessive rain during the project, the Schrader team was often found on the roof late at night or very early in the morning to make sure that the building remained watertight.

"I was very proud of our team and their dedication to making sure that the installation went well," said Sanders. "To have someone checking the roof at 3 or 4 AM or at 10 or 11 PM was not unusual, and they did a great job."

In the end Sanders attributes the success of the project to not only his hard-working employees, but also to the open and ongoing communications throughout the project with Mosaic Engineering and the Lubbock County employees, Natalie Harvill and Nick Hill.

"It was a great team and we all worked together very well throughout the process," said Sanders, "and I'm very thankful and proud of the work we did."