CARLISLE SYNTEC SYSTEMS

Sure-Seal® EPDM Roofing Systems

CASE STUDY

A Roof Built for 24/7 Operations: Performance on a Mission-Critical Data Center

Project rendering showing the facility upon completion, anticipated in 2027.

There is a growing demand for high-performance computing and state-of-the-art data centers across the U.S. to support a wide range of businesses, particularly those in the technology and engineering sectors. These highly specialized operations, which can provide a wide range of complex computational tasks such as machine learning, data analytics, and complex systems modeling, are engineered with highly redundant systems to remain operational 24/7/365 with minimal downtime.

So, when it comes to construction, it is critical that every element is not only carefully designed and evaluated but installed precisely and with the highest degree of professionalism. Such was the case with a major renovation project in Spartanburg, S.C., to convert a former manufacturing plant and warehouse into a cutting-edge supercomputing facility.

Grier Roofing, LLC, of Wellford, SC was hired to take on the massive project. Grier is a well established commercial and residential roofing contractor serving communities throughout North and South Carolina and Georgia with a reputation for delivering top-quality roofing solutions. As a long-time Carlisle Authorized Applicator, they recommended a highly durable 90-mil Carlisle Sure-Seal EPDM system for this critical project.

“Carlisle EPDM has over 60 years of real-world proven performance and weathering history in the market,” said Rob Wilkie, sales manager for Grier Roofing. “Given the importance of this data center and the need to ensure that the roof is durable and protects the facility for several decades, it was the clear choice for us to specify.”

For the project, Grier Roofing specified the membrane with Carlisle’s Factory-Applied Tape™. Besides being highly dimensionally stable and remaining flexible in extreme conditions, Sure-Seal EPDM was recommended for its long-term durability and superior weathering and hail protection.

JOB PROFILE

PROJECT LOCATION:
Spartanburg, SC

CARLISLE APPLICATOR:
Grier Roofing LLC, Wellford, SC

ROOFING SYSTEM:
Fully adhered 90-mil Sure-Seal EPDM

SPARTANBURG DATA CENTER

CASE STUDY

The project includes several roof sections totaling about 400,000 square feet, including renovation of an existing 230,000-square-foot facility roof, a 56,000-square-foot section of roof over the administrative and executive offices, and 110,000 square feet of standing seam metal roof.

"The existing BUR system had to be totally removed from the structure," said Wilkie. "In addition, there were lots of penetrations that had to be addressed, including several internal drains and curbs on the old roof that had to be removed."

A Beefy Roof Assembly

As a data center that cannot afford leaks or other issues, the new roofing assembly was beefy to say the least. The largest portion of the roof is a 40-foot-high steel deck with a ¼ : 12-inch slope designed with four quarters that each slope to interior drains.

"This is one of the heaviest duty roofing assemblies that we've ever installed," said Wilkie. "Not only will it provide maximum protection, but it's also designed to last a very long time!"

For this portion of the roof, the Grier team mechanically attached two layers of 4 x 8 foot, ⅝-inch DensDeck® Prime Roof Board to the deck as a thermal barrier. Next, they installed Carlisle's VapAir Seal™ 725TR Air and Vapor Barrier/Temporary Roof. VapAir Seal 725TR is a 40-mil composite sheet consisting of 35 mils of self-adhering rubberized asphalt laminated to a 5-mil woven polypropylene film.

"We like using the 725TR air and vapor barrier because it installs quickly and helps us get the building dried in early in the process," said Wilkie, "which was important on this project due to the construction work happening inside."

The next step was installing two layers of 3-inch InsulBase® Polyisocyanurate Insulation.

"We mechanically attached the polyiso using Carlisle InsulFast™ Fasteners and 3-inch insulation plates in all roof zones," said Wilkie.

On top of the insulation the team installed another layer of ⅝-inch DensDeck Prime Roof Board.

"We installed the top 4 x 4-foot cover boards with Carlisle's VOC-free Flexible FAST™ Adhesive," said Wilkie, "using 6-inch on center bead spacing, before applying Detec's TruGround® Conductive Primer."

Advanced Moisture Security

Carlisle has collaborated with Detec Systems to offer many Factory Mutual (FM) rated and warrantable roof assemblies that include Detec's TruGround Conductive Primer. Detec Systems' patented TruGround Conductive Primer is an easy-to-apply conductive medium necessary to effectively test conventional roofing assemblies for breaches, holes, and seam voids using quality control electronic leak detection (ELD) methods. ELD has become the preferred option for ensuring a watertight membrane on overburden installations and other critical building projects.

"The Detec primer is fast and easy to apply to the DensDeck directly below the membrane using a roller," said Wilkie, "and it provides early leak detection which is particularly important on projects like this one."

The final step for this portion of the roof was installing the 10-foot-wide 90-mil membrane, with pre-applied 6-inch seam tape, which improved installation productivity. For the installation, the Grier team rolled out and adhered the membrane using Carlisle's 90-8-30A Bonding Adhesive.

"This was the first time we used the 90-mil membrane," said Wilkie, "but it went down easily, particularly with the pre-applied seam tape. Our crew really liked working with it, and we were able to install up to 12,000 square feet per day, so the productivity was good from our perspective."

This section of the roof had parapet walls ranging from 6 inches to 6 feet. Grier encapsulated the walls by running the membrane up and over the top using bonding adhesive and then installing a shop-bent coping cap using clad metal that matched the insulated wall panels on the structure.

The Metal Retrofit Section

In addition to the main roof area, Grier had to recover approximately 110,000 square feet of standing seam metal roof on a pre-engineered building.

It was another beefy assembly.

For this section of roof, Grier first filled the flutes with 3.5 inches of loose-laid Carlisle polyiso flute fill. Over the top they installed 1.5 inches of InsulBase Polyiso, which was also loose laid. The insulation was then held in place by a ½-inch layer of SecurShield® HD Polyiso Insulation, a rigid insulation panel suitable for providing a sound substrate on the metal building. The Grier team secured the cover board through the insulation and into the panels using InsulFast Fasteners and 3-inch insulation plates.

As with the other sections of the roof, Grier then roller-applied the Detec TruGround Primer to the cover board before rolling out the 90-mil Sure-Seal EPDM membrane.

The last step was installing the membrane from eave to ridge, securing it to the purlins, spaced at 5-feet, with a 9-inch-wide Pressure-Sensitive RUSS. The RUSS strip was mechanically fastened with HP Purlin Fasteners and HP Polymer Plates.

The project required the removal of several curbs and cleaning, repairing, and re-painting several drains.

In the end, Grier Roofing was very pleased with the outcome and looks forward to the completed project in 2027.

"An owner representative came by the project and told us we did a fantastic job," said Wilkie, "and better work than some other projects that he's seen, so that was really great to hear."

But the best thing is that the new data center has a great roof with built-in leak detection that will last for decades to come, protecting sensitive data and equipment.

Learn more about our mission-critical roofing solutions for maximum protection.

SPARTANBURG DATA CENTER

800-479-6832 | P.O. Box 7000 | Carlisle, PA 17013 | Fax: 717-245-7053 | **www.carlislesyntec.com**