THE NOAA LA JOLLA , CALIF., LABORATORY REPLACEMENT PROJECT. (PHOTOS COURTESY OF GAF AND THE AERIAL IMAGE, SAN DIEGO, CALIF.)

La Jolla Roof is Work of Art

Government Project Pushes Creativity of the Building Team to the Limit

by Lynn Picone, senior product manager, GAF

Every so often, roofing contractors get to enjoy a *cookie cutter* job that flows off the drawing boards and smoothly onto the roof deck. The NOAA La Jolla (California) Laboratory Replacement was not one of those projects.

The entire job, from design, to logistics, to application, was an exercise in problem solving. The final design and execution of the National Oceanic and Atmospheric Administration's (NOAA's) new roof turned out to be brilliant, making the teamwork required all the more impressive.

Initially, the vision of architect Gould Evans Associates, based in Kansas City, Missouri, included two roofing systems that did not make the cut. The first, a cold process SBS modified bitumen, could not meet the stringent VOC standards set down in Title 24, the California Building Standards Code. Neither would a hot-applied SBS membrane meet fire requirements on the 2:12 slope of the roof perimeter.

The roofing team suggested a built-up roof (BUR) and cap sheet. This was not the way general contractor Rudolph and Sletten Inc. of Irvine, Calif., planned to go. However, the change order was accepted and the roofing contractor the GC selected, Protech Roofing Service of San Diego,

Calif., made the necessary adjustments. The roof also features a unique interior and exterior drainage system, so the complexities of the project began at the roof deck. The shop drawings were complicated and clearly demonstrate the expertise of committed professionals: Sean and Kevin Shields at ABC Supply, San Marcos and ABC Tapered Solutions in Cincinnati, Ohio. The roofing contractor also sweated the details on the 389 total applied squares of EnergyGuard™ tapered polyiso insulation from GAF of Wayne, New Jersey. GAF also supplied the ½" perlite recover board; GAFGLAS® #80 Ultima™ base sheet; two plies of Flex-Ply™ 6 roofing felt; and, EnergyCap™ BUR mineral-surfaced cap sheet, all installed with Type III asphalt.

The specifications represent a relatively straightforward *hot* roofing job. But the installation of 826 stand-up solar panels complicated the roofing process immensely. "Constant coordination was required with the solar contractor, other trades, and the GC," says Kevin Farrow, vice president of Protech Roofing Service. "What started out as a *blow-and-go* bid project turned out to be something quite different."

Architect Gould Evans chose a reliable solar system: Sharp 240w module-type solar panels and two 100kw inverters made by Satcon Technology Corporation. Unfortunately for Farrow, the solar rack system features both a penetrating and ballasted support configuration. This required the installation and flashing of 240 stanchions and extra protection for the ballast trays sitting on the BUR. Fortunately, San Diego-based Sullivan Solar did an *outstanding* job on the panels' installation, according to Farrow. In fact, the company was so quick out of the box, that some of its solar equipment needed to be removed so Protech's crews could finish drying in the roof.

Solar Support

After the roof was insulated and watertight, roofing crews needed to cut 240 2'x2' squares for the solar supports down to the roof deck at a depth of up to 10". Wood nailers were then screwed to the metal deck and roofed over. With the help of a surveyor, the solar crews were able to locate the screws in each nailer below the BUR and install the stanchions. These posts were placed about every 8' across the 380-square roof.

The question then became how to quickly and economically waterproof 240 large stanchions. Once again, the extraordinary efforts of GAF's manufacturer's representatives, Randy Swank and Michael Kearney, paid off. Swank had seen the job through the complex bidding process and handed the day-to-day, hands-on work over to Kearney, who lived in San Diego. Both men met with the architectural team and discussed the challenges in detail. As it turned out, the solar stanchion pipes were not high enough to flash with lead pipe flashings. Swank and Kearney convinced the building team that GAF's M-Curb system was the most practical way to flash the stanchions.

So, Farrow's roofing crews got to work crafting 240 M-Curbs (four corners and eight 6" straights). The contractor calculated the size of the M-Curbs and GAF's technical department determined the amount of M-Thane sealant needed to seal them. Once the cap sheet was mopped in with hot asphalt, the M-Curbs were installed. One of the reasons a cap sheet was chosen instead of a "softer" SBS membrane was point loading on the roof system from the solar ballast pans. The heavy blocks inside the ballast trays continued to be a concern for

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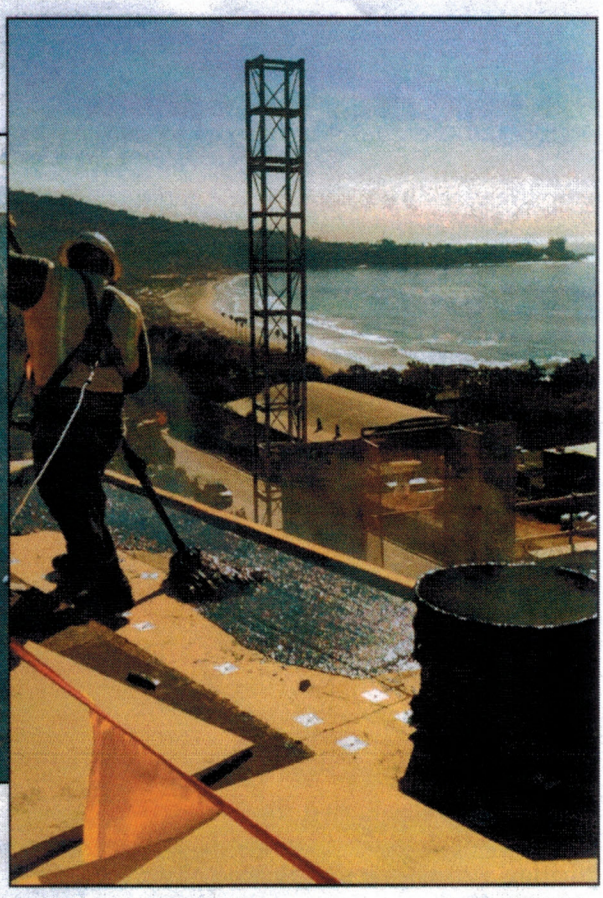

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the manufacturer's reps. "We went back and forth several times with our technical team and Sullivan Solar to ensure there would be no compression damage to the perlite, polyiso, or BUR," recalls Kearney. "We must have had ten meetings on this jobsite with the building team, but in the end, we got them (the architectural firm) exactly what they wanted." As an extra precaution, the solar crews laid sheets of EverGuard 60 mil TPO membrane beneath each ballast tray to further ease the point loading on the BUR system.

Logistical Challenges

Farrow is modest about Protech's role in the roofing of the NOAA facility, despite the laundry list of logistical challenges his company faced. Not the least of these was safety. One of the mottos of general contractor Rudolph and Sletten Inc. is, "The safest and the best." This was a high-profile project that required constant safety monitoring.

Because the exterior drainage plan included a 2' leading metal edge (followed by a 60'-80' drop-off), warning lines and tie-offs were mandatory within 6' of the roof edge. "This project was highly oriented toward safe roofing," says Farrow. "Our company's good safety record was one of the reasons we won the bid. Also, the staging for the project was one of the most difficult I have ever experienced." The building was constructed in the middle of an exclusive residential neighborhood and borders on a hairpin turn on La Jolla Shores Drive. The roofing crew began their day by parking ten miles away and boarding a shuttle bus provided by the GC to the jobsite.

When distributor ABC Supply scoped out the jobsite for materials delivery, the San Marcos manager was ready to throw his hands up in frustration said Farrow. Because of the site's steep slope and limited access, the distributor was not sure if its truck-mounted, heavy-duty *knuckle boomer* cranes would be able to reach the rooftop.

Protech wound up renting an extreme 10k reach-forklift and loading most of the materials using its own crews. However, the GC came through with a large crane to help the roofers relocate and redistribute their materials on the roof to avoid overloading the structure.

The roofing contractor was faced with yet another challenge during the installation of the tapered insulation system. Try as it might, Protech was unable to re-use the large amount of polyiso scrap generated by the job. Because of the sharp angles, edges, and diagonals in the tapered design, small pieces of waste insulation built up at an alarming rate. "We were forced to take our trash off the roof by crane every two or three days," says Farrow. "These were all seemingly small issues, but they really added up on this job."

Maintaining the aesthetics of the light-colored portions of the roof was a serious concern for the architect. On a hot-mopped BUR job even the cleanest of crews will get footprints on the membrane. Farrow solved this problem by seam and spot-coating the roof with GAF's TOPCOAT® white, elastomeric roof coating. By the time the job was finished, the majority of the roof's surface had been touched up using Protech's Graco spray rig.

"You will rarely see a more beautiful building or a nicer looking roof," concludes Kearney. "The view from here is just spectacular."