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ILLUSTRATED



LED

Architects

AgiLight LEDs Light up
NDSU's Research &
Technology Park Signs.



Architects

In

LED

Light Emitting Diode (LED) technology

continues to make an impressive impression in the realm of solid-state lighting applications. Whether used to illuminate signage, channel letters, architecture, or interiors, the LED concept is successfully being accepted by customers, after suggestions from lighting designers and installers. The end-results are lighting projects are distinctive views that solve certain pre-existing problems.

For example, here's an LED architectural lighting application that can also probably be referred to as "Big LED Project on the Prairie."

Last year, full-service Cook Sign Company (www.cooksignco.com) of Fargo, North Dakota, teamed up with LED product provider AgiLight (www.agilight.com) of San Angelo, Texas, to create, install, and turn on an illuminated signage application for the main building at North Dakota State University's (NDSU) Research & Technology Park. (*Note:* Cook Sign Company is one of the oldest businesses in Fargo—110 years and counting—and its ties with nearby NDSU are very tight.).

Main: The NDSU complex before its LED makeover.
Inset: the original artist rendering.



PHOTOS BY COOK SIGN COMPANY.

At this fifty-five-acre location, university researchers and private industry combine their talents to create new technologies, methods, and systems for a variety of industries—including computing, electronics, defense, nanotechnology, and much more. It should come as no surprise, then, that, with this background, NDSU officials would elect to turn to LED lighting technology to decorate the Research & Technology Park's main building with extremely bright illuminating identification signage and accent work.

Designed to resemble a computer board, the sign project would highlight the NDSU name using the school's green and gold colors. The intention here is that the LED lighting would complement the creative work being done at the Park. "Whatever we did, first and foremost, had to give an impression of technology and tie into the Park's overall mission," says NDSU Technology Park Director Tony Grindberg.

Cook Sign Company drafted ideas and designed the sign under the direction of CEO Matt Brasel, Sales Representative David Selvig, Art Director Greg Nelson, Sales Manager Brett Waldera, and Installation Manager Brad Warkenthien. They, in turn, worked

with AgiLight's Jeff Barton, who flew up to Fargo to help with the design and installation. Everyone agreed that LED tubing would give the impression of electronic circuit boards and state-of-the-art research-and-development that the university desired. (And since the complex is located near an airstrip and a freeway, Park officials also wanted a sign that could be seen from the air *and* ground level.)

"After several meetings with NDSU officials, we had a pretty good concept of what we thought we might want to come up with—which was LED lighting," says Selvig.

(*Note:* Cook Sign Company is no stranger to the aspects of solid-state LED lighting—it's been working with the technology for almost eight years now and with AgiLight's products for about two years.)

"I didn't get into the technical aspects of LED," replies Grindberg, when asked about what factors contributed to the school's decision to accept the use this solid-state lighting technology. "From my perspective, it was more our long-standing relationship with Cook Sign and what they envisioned in realizing what we were hopefully trying to provide with a unique look."

Working with the university and its various committees, it took Cook Sign Company about eight months before the design was finally approved. This was due in part to the schedule of the campus officials and committees who were reviewing the various options and finally making an ultimate decision.

When this enhancement project started late in the year, the main objective among all parties involved was to complete the lighting project before NDSU's first home fall football game of the season.

On the side of the main building is an immense 30-by-100-foot sign comprised of green shutters, which are lighted to represent computer chips. Connecting the "computer chips" is gold LED tube lighting that's designed to look like computer connectors. The "computer chips" and "computer connectors" are connected to huge, nearly-seven-foot-wide discs that are designed to look like computer discs. Inside each "computer disc" is the school's lettering—"NDSU." The discs are illuminated with both facelit and backlit lighting, which give them a glow and show off the green and gold letters.

"One unique feature of the building—when it was originally designed—was that the glass shutters were supposed to



depict computer chips,” says Brasel. “They looked okay, but unfortunately, they didn’t stand out. Nobody passing by the building recognized the shutters as computer chips. So as the project moved along, the challenge became: How can we light up those chips so that people can realize what they were trying to do with them originally?”

For this project, Cook Sign Company used 60 feet of AgiLight’s BrightStrip LED modules to light up the “computer chip” shutters, 400 feet of its white SideWinder LED modules to illuminate the nearly seven-foot-wide computer discs (as well as 90 feet of the green SideWinder for the backlit version), and just over 300 feet of BrightLine flexible LED tubing to connect the computer chips (green shutters) with the discs (resembling gold circuits).

Because of the tight angles in the “computer board” design, the designers decided to use BrightLine to solve this challenge. The flexible tubing could accommodate the sharp angles required by the design and still retain uniform brightness. “First of all, we were worried about the tight bends because there’s a lot of ninety-degree angles,” says Waldera. “BrightLine allowed us to make a lot sharper bends than we had

anticipated for LED striping—so much so that it didn’t end up being that much of a problem.”

Warkenthien cut the BrightStrip and BrightLine on-site. “A lot of times, you start laying out things in the shop and they don’t turn out to [truly represent] the actual building,” he says. “So when an installer gets out there, he can cut it to fit. We didn’t have to prep anything inside the shop and then go out and start laying it out. This saved us a lot of time at the location.”

The parties involved were concerned about the number of building penetrations that would be required in order to create the design using exposed neon tubing or some LED tubing systems. The BrightLine product allows up to 240 continuous feet of tubing to be run from a single power connection, which were mounted on the roof (as no building penetrations were allowed in the secure facility).

Cook Sign Company employees mounted the BrightStrip modules onto the backs of the shutters and then adhered them onto the building with metal studs. “They come in six- and eighteen-inch lengths and attach into a plastic track that can be cut to a desired length with a clear shield over them and

the wires,” says Warkenthien. “Since they’re 24V DC, we just soldered them together and shrink-wrapped the ends and then slid them into the plastic track and sealed the ends.”

“The track that the BrightLine snaps into were created fairly easily. It was a matter of laying it all out on that long building side. The biggest thing, though, was the power supply. [*Ed. note:* Cook Sign Company employed 4-amp power supplies, which allowed them to run up to the available 240 feet.] We had to run all the wires up the building and try to keep it from being non-clutterable. We were trying to hide the wires (primary and secondary) as much as possible. All the power supplies are up on the roof and out of sight. We hid all the wires with plastic track and metal conduit.”

There were several reasons why Cook Sign Company suggested using LED technology for this architectural lighting project. As Warkenthien just pointed out, they weren’t allowed to make any penetrations through the wall. “It’s a highly secure building,” he says. “There’s a lot of research and nanotechnology going on in there, so they told us there would be no penetration in the building whatsoever.”

Another reason (in addition to



AgiLight's products fitting close to the University's green-and-gold color scheme) involves conservative energy usage. "In today's society, the big push is to go 'green,'" says Nelson. "With that in mind, we wanted to look at something that would lower power consumption.

"Light Emitting Diodes are also less expensive than other types of accent striping," adds Selvig. "And the life expectancy of it is anywhere between 50,000 to 100,000 hours (based on the colors you're using)."

Because NDSU wanted an extremely bright sign, Cook Sign Company crewmembers performed all product testing and installation at night so the brightness could be tested to ensure that it would meet the client's expectations. "We were amazed at how bright everything was," says Brasel.

Employees also performed signage testing at night during winter conditions to make sure the LED products—which are designed to withstand extreme operating temperatures without diminished brightness, color shift, or start-up problems—would work. (*Note:* The Fargo area experiences anywhere from thirty-

to forty-below-degree temperatures in the winter to upwards of a hundred degrees in the summer—definitely an extreme range.)

But how do conditions affect the people who install this lighting? "Weather and extreme temperatures only affect our people a little bit and not our signs," says Brasel. "People can't do business without their signs and want them installed, regardless of the conditions. Weather doesn't play a huge part in our ability to get things done because our guys outside get easily acclimated.")

The signage shows off the NDSU name with a brightness that can be seen from the freeway and the skies above. It might not have been a new undertaking for Cook Sign Company, but according to Selvig, it was certainly the largest. "The total project took conservatively about two weeks to perform, consisting of 120 man hours," says Selvig. "There were sometimes two and three people at the same time during installation. We fabricated the circles in-house and all the exterior lighting (BrightStrip and BrightLine) on-site. We used two bucket trucks to install the lighting products

onto the building."

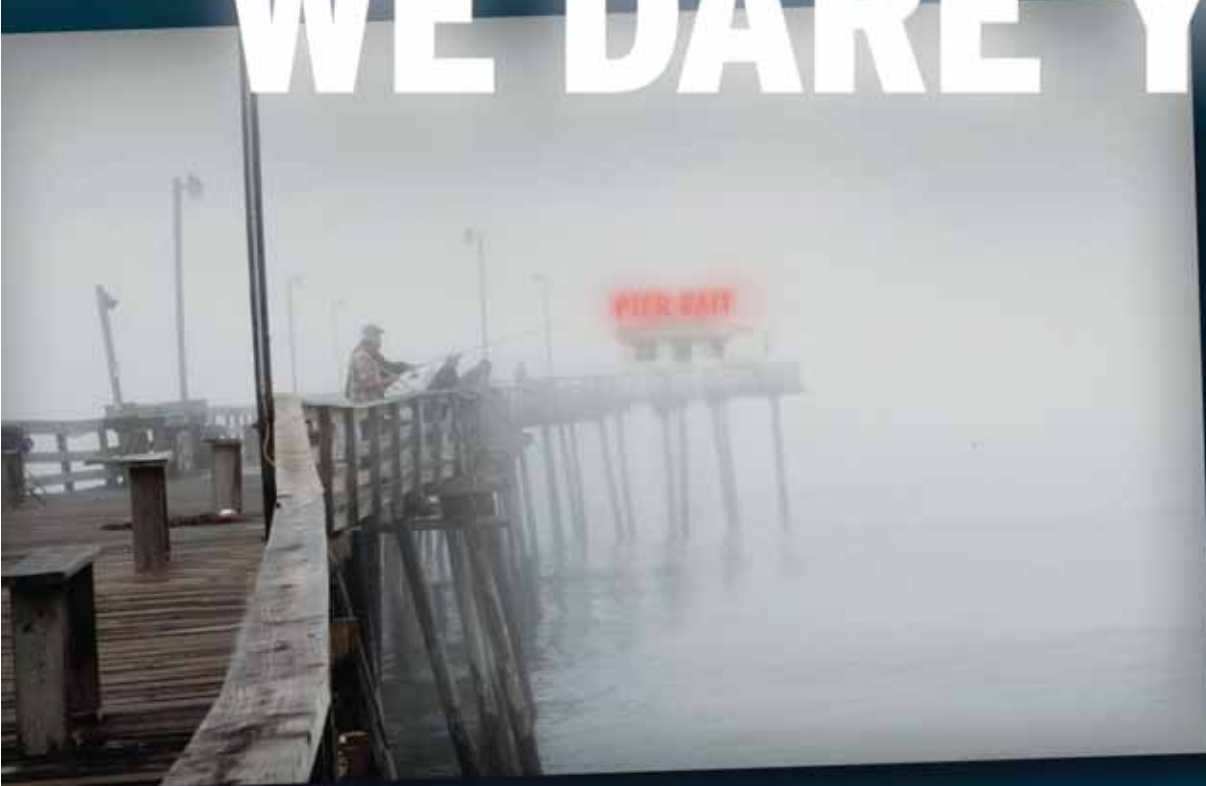
The finished LED sign lighting has garnered newspaper coverage, and according to Grindberg, all comments have been positive (ranging from "neat looking" to "eye-catching"). "Together, Cook Sign Company exceeded our expectations with signage that's brilliant and extremely bright with a creative depiction of technology," he says.

"When [Art Director] Greg Nelson finished the design, we all thought it was incredible," remarks Brasel. "Everyone at the university thought it looked good, and it definitely exceeded our expectations. If anything, I don't think [Greg's] sketch truly indicated how bright the product really is, so it came off even better than what we'd expected."

For Selvig, the finished project provided even more satisfaction for him since he'd worked with NDSU on many projects other than signage for many years. "We did everything possible to make sure that with the great concept Greg designed and the information NDSU folks provided that it would all turn out as we had imagined." Mission accomplished! ■

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