For wall contractors wanting a challenge, try hanging cement board on an elementary school that’s shaped like a turtle. The radiuses can be quite severe.

“When you build a school in the shape of a turtle, you’re going to have some unusual wall surfaces,” said Debbie Spees, accountant, Oneida Tribal School. “There are almost no 90-degree angles throughout this school.”

Completed in August 1994, the $14 million, 160,400 square foot Oneida Tribal School has four “legs,” a “tail” and a “head.”

The $14 million, 160,400 square foot Oneida Tribal School has a curved exterior and very few right angles.
Oneida Tribal School has four “legs,” a “tail” and a “head.”

Its unusual shape is thrilling for Oneida Indian children. Kindergartners attend classes in the “tail.” The first through eighth grades meet in the “legs.” There’s a wood-floor gymnasium in the “head,” and science labs, a cafeteria and an auditorium throughout the turtle. The school’s “belly” is home to the library and teacher’s offices.

For its architecture, interior design and exterior construction, the Oneida Tribal School is ingenious. The building materials and workmanship are top quality. It has ceramic-tiled interior walls, terrazzo floors and fine woodwork throughout the hallways and classrooms.

**Significance of the Turtle**

The Oneida Nation is a sovereign government in territory near Green Bay, Wisc. The nation originally occupied land in what is now New York state, but lost it in a series of ill-suited treaties. One of six Iroquois tribes, the Oneida migrated to Wisconsin in the mid 1800s.

Today Oneida tribal membership consists of about 12,000 Indians. The Oneida Business Committee, working with a $94 million operating budget, oversees the nation’s business ventures. Those ventures include casinos, hotels, convenience stores, printing shops and farms, to name just a few. The Oneida funded construction of its new school largely with proceeds from gaming operations.

What’s the significance of the turtle to Oneida Indians? All Oneidas are born into one of three tribal
clans: the Bear, the Wolf and the Turtle. The Bear clan is responsible for the nation’s knowledge and medicine. Oneidas revere the Wolf for its sense of family. The Turtle represents the earth and its produce. Each clan has its system of government, but the Turtle clan encompasses the overall governmental body of the nation.

From early on, the Oneida Indians teach their children their cultural heritage and language, and they continue that education in elementary school. So it is not surprising that an Oneida schoolboy first submitted the idea of building a turtle-shaped school.

**Making It Happen**

Designing a school as a turtle is one thing. Building it is another.

Calculating the material requirements and bidding this job wasn’t easy for contractors and subcontractors.

“It was a challenge right from the startup estimate,” said Joel Johnson, whose company, H. J. Martin of Green Bay, Wisc., contracted to build the interior and exterior walls. “Bidding the job was an ‘iffy’ process. We had to come up with a clever way to calculate the bid.”

The problem was this: The “Turtle School” has several tight radiuses. The wings of the school—the turtle’s “legs” and “tail” sections—have a 4-12 exterior surface pitch and some tight corners. This unusual design called for a unique exterior wall. It required a product that was both flexible and durable. DuRock Direct-applied Exterior Finish System from United States...
he curved exterior wall surfaces of the recently
n the Oneida Nation near Green Bay, Wisc.

Krueger’s crew had to improvise. For example, the contractors cut the board in a way that allowed it to wrap corners and maintain straight top-and-bottom edges. Krueger described the process as “orange peeling the panels.”

Similar to the hull of a boat, where boards become thinner as they approach the bow, Krueger and his crew cut the board horizontally into concentric, orange-peel-like sections. Then they fitted the sections together around the radius. The cuts were initially made by trial and error. Once the right shapes were determined, however, they became templates to cut cement
board for the remaining corners.

“Seeing that the panels can curve was very impressive,” Krueger commented. “I had never seen that before.”

THE BOARD WAS CUT HORIZONTALLY INTO CONCENTRIC, ORANGE-PEEL-LIKE SECTIONS.

Of course, the bending process strained some boards. That was true especially when joints fell on corners. Again, the wall contracting crew came up with ingenious solution. When a joint came immediately off a curve, making it difficult to screw into the panels without cracking the edges, the contractors expanded the back screwing surface. They attached steel bands to the wall studs.

“We’d put a piece of three-inch band steel behind the joint to create a wider screwing area,” Krueger said. “The screwing area without the steel was 1 ¼ inches—five-eighths of an inch on each side. However, by screwing band steel into the steel framing, we could screw farther from the joint edges.”

Randy Cottrell of Cottrell Plastering, Appleton, Wisc., was in charge of taping the joints and applying the base coat and finish. USG Exterior Basecoat was used throughout the exterior surface, except on the corners of the legs and tail. For these tight radiiuses, a non-cementitious base coat was used with a continuous reinforcing mesh to provide additional cracking resistance. Finally, USG Exterior Textured Finish completed the job.

“The finish coat seems to have more elasticity than other brands. It has good workability and doesn’t drag,” Cottrell said. “I like the finish. The whole system is easy to work with.”

The Oneida Tribal School project called for approximately 1,200 sheets of cement board. It required enough base coat and finish coat material to cover about 40,000 square feet of exterior surface. Wall construction began in January 1994 and was completed in May. Finish coating was finished in June. In September 1994, about 460 native-American pupils began attending classes in their new turtle-shaped school. CD

About the Author
For further information on the DUROCK Direct-Applied Exterior Finish System contact United States Gypsum Company, Chicago, at (800) USG-4YOU.