

# Test of TIME

BY CRAIG ALEXANDER, S.E., P.E.

Seneca Construction Management Corp.



A casino project, meant to help bring Buffalo's waterfront to life, comes back to life itself after a years-long, recession-induced delay.



▲ The structural steel was dismantled and initially intended to be sold off as surplus.



**Craig Alexander** ([calexander@wendelcompanies.com](mailto:calexander@wendelcompanies.com)) is a senior structural steel engineer with Wendel Duchscherer.

**SEVERAL CITIES AND TOWNS** line the shores of the Great Lakes. One of the bigger ones, Buffalo, N.Y., sits at the eastern end of Lake Erie. Yet despite its location, the city's waterfront has long been underutilized.

In recent years, however, things have been looking up for the area, and the Inner Harbor District, a vibrant and rapidly growing recreational and mixed-used district, is currently experiencing more than \$1 billion worth of ongoing construction.

One of the anchors of the area is the new \$120 million Seneca Buffalo Creek Casino (SBCC), a permanent casino that replaced a temporary, slots-only casino that had operated on the 9.5-acre site since 2007. But the project was almost scrapped entirely not long after it began.

The Seneca Nation of Indians had initially planned a \$333 million casino and 26-floor hotel complex, one of the largest privately funded projects ever undertaken in Buffalo. Planning began in 2005 and construction started in 2007. However, the 2008 recession, which ravaged the construction industry, did not spare this project and it was put on hold that September. All construction activities were immediately halted and contractors demobilized. The partially erected steel frame of the casino podium lay dormant along with approximately seven acres worth of precast double tees intended for the eight-story parking structure. Fabricated steel that was not yet erected was shipped to the project site and stockpiled, as were bundles of galvanized metal deck and piles of rebar and wire mesh.

While the abandoned project blended into the surrounding deteriorating areas, the unfinished structure drew much negative press as it was seen

as yet another failed project in downtown Buffalo. The resolve of the Seneca Nation did not allow that to be the case for long. In 2011, they revisited their original plans to build a destination resort and decided to scale down the extravagant design into a smaller regional gaming venue. The new facility would include a casino, several restaurants, a bar and a 715-car parking ramp, but no hotel or entertainment venue.

### On Hold

Both the erected and stockpiled steel had been exposed to the unpredictable and tumultuous western New York winters for four years. To make matters worse, the project site is within 200 yards of an elevated expressway that receives heavy doses of deicing salts throughout the winter months. The presence of airborne salt spray accelerated the deterioration of the steel, particularly on members orientated in such a way to allow for water to pond. Some parties involved with the project were concerned that the steel would rust to the point of being unusable after the first winter. Because the owners understood the value of the steel, however, they commissioned annual surveys of the steel to monitor its condition.

At the onset of the scaled-down project, some parties had written off the reuse of any steel and actually started the process of liquidating it as surplus prior to the project team being engaged. The owner's representative and structural engineer (Wendel) were able to convince the remainder of the project team of the potential value of reusing the existing steel, both from a financial and scheduling point of view.

"In recognition of the significant investment that had been previously made at the site, one of the key design briefs was to

maximize the use of that prior investment to the most 'practical' extent possible," said Rob Chamberlain, senior vice president of design and construction with the Seneca Gaming Corporation. "In addition to lining up the new casino on the same 60-ft by 60-ft grid as the original project, the piles and foundations already in place were used as well."

### Testing Time

At this point, Wendel's structural engineers were tasked with several unique assignments. The first task was to confirm the structural steel was indeed still sound for reuse. After several conversations with AISC's Steel Solutions Center, it was determined that no technical guidance was available, nor was there any documented precedence established by other projects, regarding the use of steel that had been exposed to the elements for a number of years. Extensive ultrasonic testing was done on all steel that was to be reused, and it was determined that even though the steel was visibly rusty and loose mill scale was prevalent, there was no measurable section loss to the steel members. Testing was also performed to assure that spray-on fireproofing would have an adequate bond to the rusted surface. The team determined that the only preparation work needed was to remove the loose mill scale from the steel with hand scrapers.

Bundles of galvanized cellular and composite metal deck had also been stored outside and exposed to the elements. The composite metal posed the greatest concern to the team as the nested nature of how the individual sheets were stacked could trap moisture, whereas the cellular deck allowed for adequate airflow throughout the stack. Bundles of the deck were broken apart and tested for sheet gauge and galvanized coating thickness

◀ The original casino framing, partially dismantled.

▶ The completed casino used 94% of the original steel framing.



Hnedak Bobo Group, Inc.





◀ Erection of a reused steel truss.



▲ Fabricated steel was exposed to the elements for four years before reuse.  
▼ The completed structural frame.



▲ The project team was concerned about potential corrosion caused by trapped moisture in the nested sheets of composite metal deck.



via ultrasonic testing methods. It was proven that all of the metal deck was still within specification, and with the exception of the top sheet of the bundle, still had the appearance of brand new decking.

The second—and even more dubious—task for Wendel was to provide a piece list of steel to be saved while the project was only at the schematic design level. This had to take place at the same time that cranes and trucks were running and hauling stockpiled material off-site to make way for the new project. The available material fell into three categories: 1) erected, 2) fabricated but not erected and stored at the project site and 3) unfabricated stock purchased for the original project and stored in two different fabricator yards. It was at this point that an excellent working relationship with the steel fabricator, Buffalo Structural Steel, proved invaluable. Wendel was able to quickly determine that the erected steel would not be feasible for reuse based on the dismantling schedule, and also worked closely with the architect to quickly finalize the footprint of the building. With this information in hand, Wendel quickly correlated available steel piece marks to members. Through the use of BIM software (Revit), every piece was identified with the member shape and piece mark so it could be catalogued and tracked throughout fabrication. A database was queried and the list of correlated materials from the various stockpiles was provided to the steel broker and steel fabricator. This allowed the steel contractor to put the building “puzzle” together as envisioned.

While the program of the facility changed extensively, the footprint of the building was intentionally kept similar to the initial design to make the most of the existing foundations. Where existing driven piles and pile caps did not exist at new column locations or have adequate capacity for lateral loads, grade beams were used so no new piles had to be driven. With a similar philosophy of reusing the existing structural components to the greatest extent possible, entire 60-ft by 60-ft bays of roof framing were reused—in their original locations when possible—as this minimized the number of connections that needed rework. One caveat was that the original casino was to be three stories while the new casino would

◀ A decorative column cover designed to represent the “Tree of Peace,” celebrating the Seneca Nation’s cultural history.



▲ The building uses 540 tons of steel.

be only one story, so the base of the upper column stick that framed into the bays of roof framing was prepped for a column splice, not base plates. Those particular columns were shipped back to Buffalo Structural, cut to length and attached to base plates that matched the original anchor bolt patterns.

### Green and Flexible

Incorporating what was initially thought to be unusable steel into the construction of the new casino not only exemplifies the sustainability and adaptability of structural steel as a building material, but also surpassed the owner's original financial and schedule estimates.

"The team was highly successful in adapting and designing the new casino such that most of the materials used in the new structure were sourced from the initial development project," said Chamberlain. "We appreciate their efforts in looking at our projects not simply as a design exercise but also from the perspective of good business practice."

Through the team's diligence and perseverance, 94% of the building's total steel (540 tons) and approximately 85% of the

foundations and anchor bolts were reused—a level deemed unattainable at the onset of the project. Taking this route reduced the cost of the steel package by an estimated 20% and the schedule by a month, as compared to starting over completely. The SBCC opened this past summer and is doing its part to achieve another goal that was long deemed unattainable: revitalizing Buffalo's downtown waterfront. ■

### Owner

Seneca Nation of Indians (SNI)

### Architect

Hnedak Bobo Group, Inc., Memphis, Tenn.

### Structural Engineer

Wendel Duchscherer, Buffalo, N.Y.

### Construction Manager

Seneca Construction Management Corporation

### Steel Fabricator

Buffalo Structural Steel, Inc., Amherst, N.Y.  
(AISC Member/AISC Certified Fabricator)