Transformative impact of the New Hartford Healthcare Amphitheater on the revitalization of Bridgeport, Connecticut

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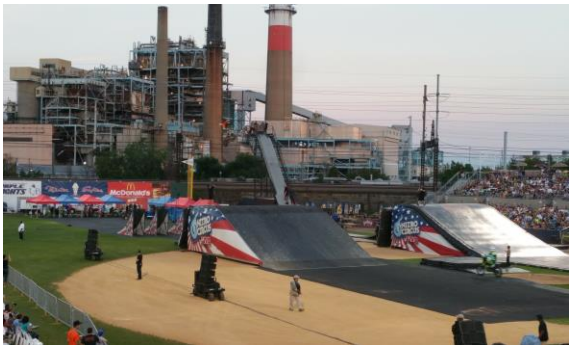
Abstract

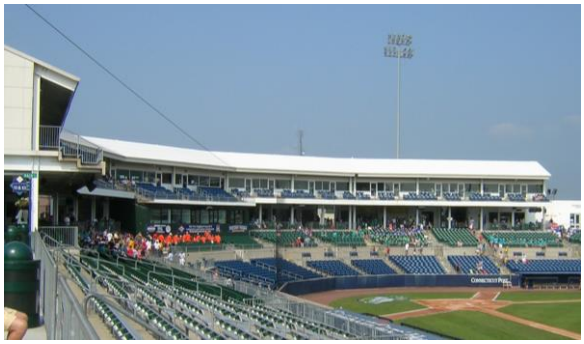
The amphitheater, a symbol of cultural and economic resurgence, has become a catalyst for urban rehabilitation, fostering community engagement, tourism, and economic growth in Bridgeport, CT. Through a detail approach, this paper aims to dissect the complex roof geometry and execution during a post pandemic period and its broader implications for urban development. The architectural and functional aspects of the amphitheater. The multi-disciplinary team involved and the logistics to make a venue that enhances the community and a safe space for the diverse cultural events hosted. From concerts to local festivals, the amphitheater serves as a focal point for community gatherings, fostering a sense of unity and pride among Bridgeport residents.

Keywords: Rehabilitation, Amphitheater, Sustainable, PTFE, ETFE, complex structure, flying mast,

1. Introduction

The Ballpark at Harbor Yard opened on May 21, 1998, on the site of the former Jenkins Valve factory. The demolition of the Pequonnock apartment buildings in 2002 improved the parking situation for fans attending games at the Ballpark. The Ballpark and Total Mortgage Arena are credited for revitalizing the city into a prosperous waterfront attraction and destination. In 2017, the Ballpark was closed by the city. When errors come to light following a building's occupation, the path forward typically presents two alternatives: demolition or renovation.





Picture 01 Nitro Circus event over the old field. Picture 02 Grandstand view of the old ballpark.

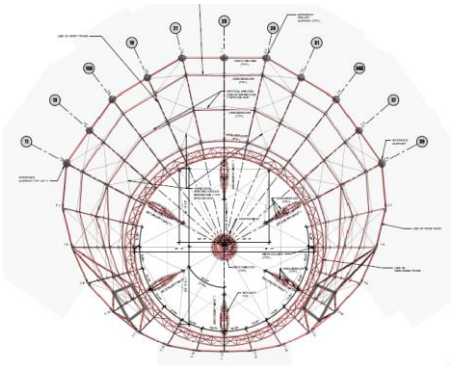
In 2018, the project for this venue was presented to Bridgeport's Mayor and green light was given to the new amphitheater. This venue needed to serve as a multipurpose project to reactivate the economy around the area.

As for the "new" Hartford Amphitheater Developer Howard Saffan and Designer Nic Goldsmith wanted to create a unique boutique concert venue while utilizing as much as possible of the old infrastructure.

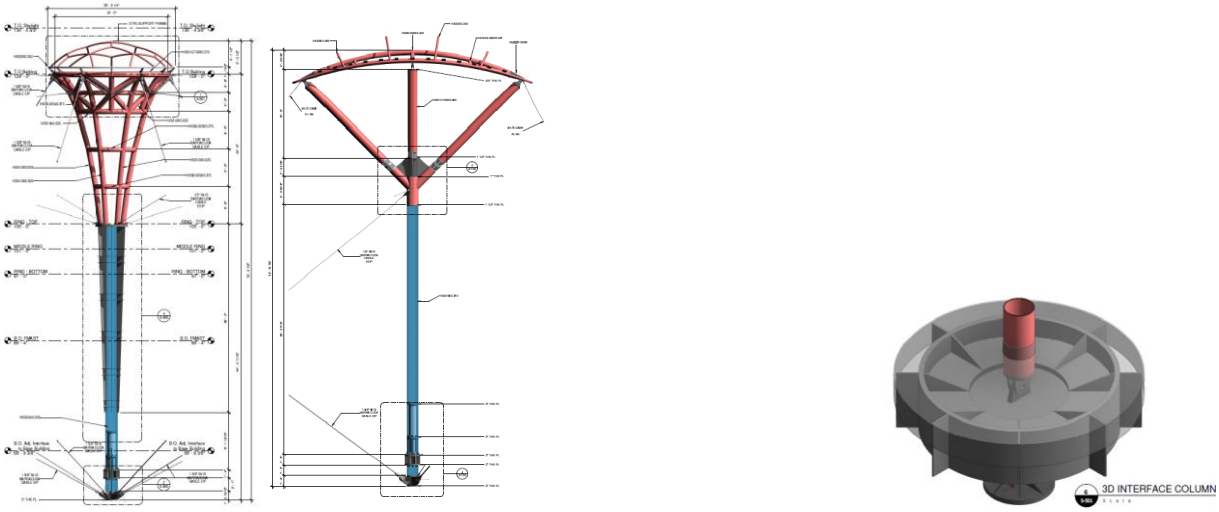
Demolishing the entire stadium and starting from scratch was never an option. The goal was to significantly reduce carbon emissions and avoid excessive use of additional materials. This was a "surgically operation" addressing only the necessary changes, removing what's obsolete, and incorporating modern features like a lightweight roof cover. This way, you transform the venue into a 21st-century facility without unnecessary cost or waste.
The design of the roof represents every aspect of complexity in the tensioned fabric industry combining cable supported mast, tensegrity and a gigantic "chandelier" flying mast structure to support it all in the middle. Another element of complexity was the local weather conditions like extreme winds, snow, and rainfall. The proposed geometry embraced the existing grandstand leaving the identity of the ballpark and the transformation of new dynamic and unique roof that needed to catch the eye of the commuters on I-95 (one of the busiest highways in the world) as well as to become a new symbol for the city. To achieve this "glowing/lamp shade" effect, the fabric selected was PTFE form Sherfill combined with ETFE closures of all flying masts creating an effect with LED lighting.

Picture 03 Conceptual Render of the design concept.

The main roof consists of a ring supported by four columns, one principal flying mast and six secondary flying masts that work to give the desire geometry to the center area of the venue. A skirt of twenty-six sections covers the rest of the area, supported lateral to 2 frame structures, and vertical to 11 sliding connections to transfer only vertical loads to the existing structure.

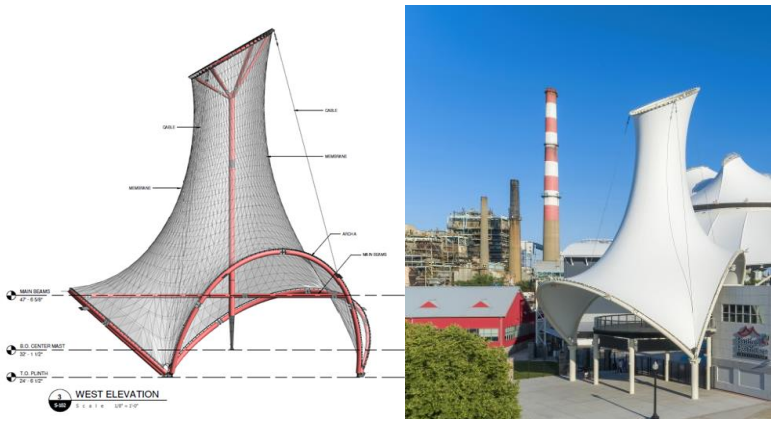


Picture 04 3d of steel structure. Picture 05 plan view of model.



Picture 06-07 Detail of main and secondary flying masts. Picture 08 3D concept of sliding connection.

At last, an entrance sculpture was constructed, serving as a welcoming beacon of light for guests. This design pays homage to the chimneys of the former factories around the area which once served as the economic heartbeat of the city.

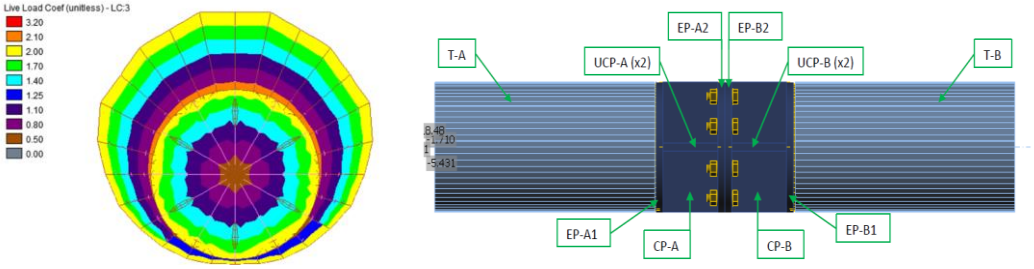


Picture 09 3d model of the entrance sculpture. Picture 10 reference to the chimneys and the sculpture.

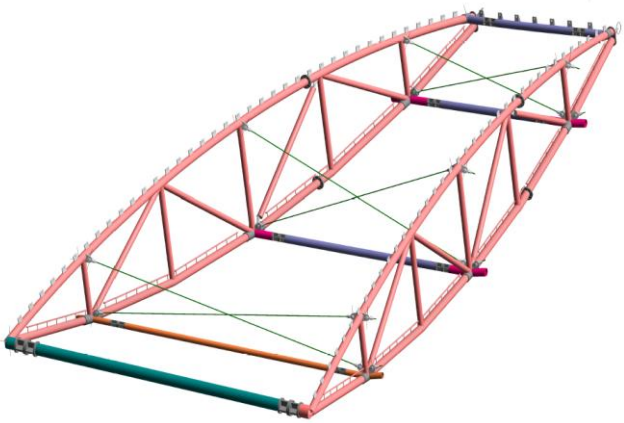
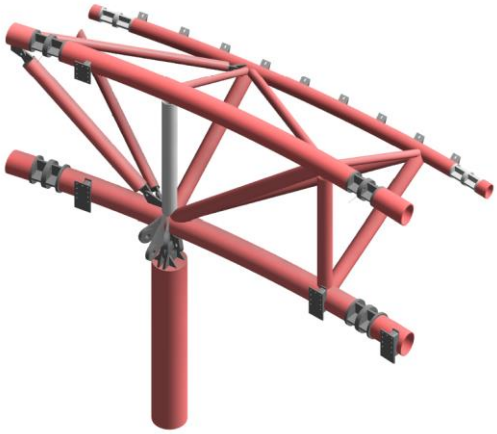
2. Engineering

For such a complex roof, wind and snow loads were very high, this area of the northeast is known for high levels of snow accumulation during winter combined with high wind loads by the proximity of the seaside. All assembly pieces were performed using diablo connections along with articulations to avoid additional stresses and facilitated the complicated installation program.

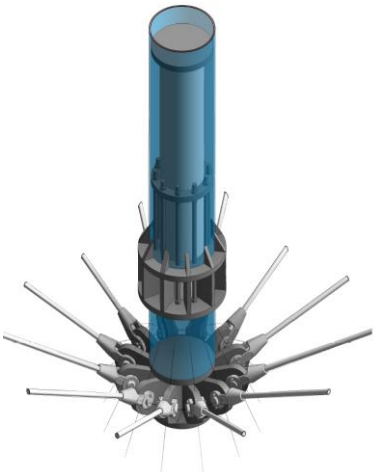
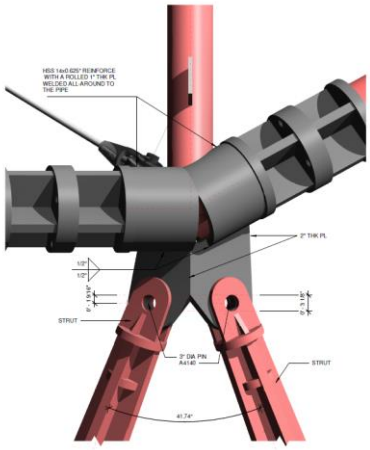
A significantly number of hours were spent together with the client and FTL's design team to achieve the correct geometry and detailing for the main roof and the entrance sculpture. In addition, the pattering needed to strictly follow specific design lines, to enhance every aspect of the spectator's experience.



Picture 11 show sample load distribution. Picture 12 Show all elements been check for a diablo connection.

Picture 13 one module of the skirt section. Picture 14 Show ring detail to column.

Picture 15 bottom of main flying mast detail. Picture 16 detail connection to skirt and entrance brace element.

3. Fabrication and Erection

According to the drawings, they depict the complex and intricate geometric designs by the architects. To fabricate according to these models, we adhered to a very narrow tolerance QC-QA program, which involved preassembling all sections with "0" tolerances to ensure proper fitting into position. We coordinated with the steel shop in Mexico for the fabrication of 290 tons of steel, 271 galvanized steel cables, 7,482 sqm of PTFE fabric divided into 33 sections, 2,650 meters of aluminum profiles, and 260 sqm of ETFE skylights divided into 8 sections.
For the erection, we coordinated a team of professionals led by our project manager, Marcelino Gonzalez. The team worked for 6 months, utilizing up to 4 simultaneous cranes and 6 boom lifts within a tight space while other parts of the site were being rebuilt.

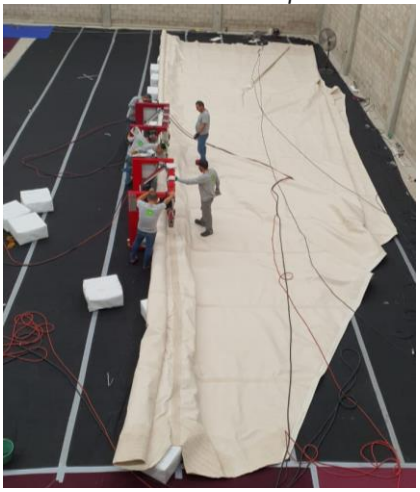
3.1 Steel fabrication


Picture 17 bottom of main flying mast fabrication. Picture 18 detail of ring section.


Picture 19 Pre-assembly of ring before ship to site. Picture 20 Pre-assembly of skirt before ship to site.

3.2 Membrane fabrication


Picture 21 Fabrication of Skirt section (2-26). Picture 22 Fabrication of the main dome section (1 of 6)




Picture 23 connecting main dome section. Picture 24 Welding reinforcements into man dome section.

3.3 Steel Erection

Picture 25 unload sections of ring ready for erection. Picture 26 last section of ring been install.

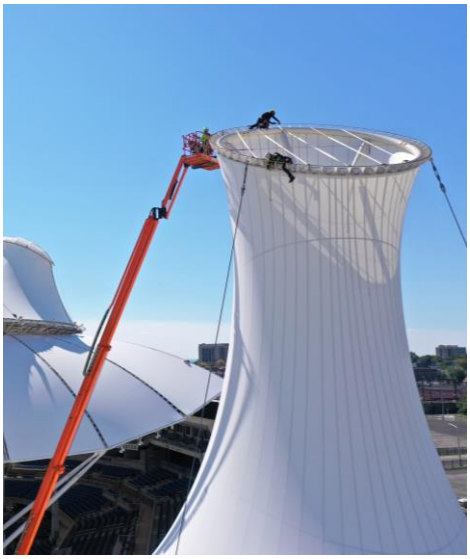
Picture 26 skirt erection and connection to ring. Picture 27 progress of skirt and main flying mast ready to lift.

Picture 28 The completed main steel structure along with the flying mast, which awaits the arrival of summer for fabric installation. Additionally, cranes working diligently to erect the entrance pavilion.

3.4 Fabric installation

Picture 29 progress of skirt panels being installed. Picture 30 tensioning of skirt fabric panel.


Picture 31 expanding the first two sections of the main dome, also the position of the four packages of fabric in place. Picture 32 shows all six fabric panels been align and connected.

Picture 33 process of the entrance pavilion been tensioned. Picture 33 preparation for the ETFE skylight to be installed.

4. Final Result

After overcoming challenges such as Covid-19, a harsh winter, and other adversities, the venue was ready for the opening night, with Foo Fighters headlining the grand event. Proudly completing the work on time, a fantastic concert was delivered, and the goal was achieved. Both the venue and the entrance pavilion were ready for events, allowing the owner to utilize the area as intended.


Picture 34 full view of the finished project. Picture 35 The intended illumination of the entrance pavilion meant to serve as a beacon of light, welcoming all to the venue.

5. Conclusion

This project really showcases the benefits of private-public partnerships in revitalizing economic deprived areas while taking the most advantage of existing unused infrastructure while having a minimal impact on the environment. The results feature an open-air pavilion and two large concourses, as well as intimate VIP Clubs, making this venue the perfect atmosphere that celebrates extraordinary hospitality and service. As a result, The Hartford HealthCare Amphitheater has been the recipient of the Venues Now All-Star Award, Best Connecticut Music Venue, Project of the Year Award SEAA, 2022 IAA International Achievement Awards.

For the city of Bridgeport, the new Hartford HealthCare Amphitheater continues to showcase top international artists while creating much needed jobs and reviving the area's spirit as a New England destination. Thanks to the hard work and persistence of all involved, the Hartford HealthCare Amphitheater will serve the community for many years to come.