

## **Planning, Designing, Engineering, and Constructing a Long-Span Lightweight Tension Structure Project**

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### **ABSTRACT**

David Campbell will summarize the development of the new roof for Syracuse University Stadium from concept to completion as an example of the considerations and processes involved in realization of a long-span lightweight tension structure. The new roof for Syracuse University's covered stadium, then known as the Carrier Dome (now the JMA Wireless Dome) began with concept studies in 2017 and was completed in September of 2020. The Carrier Dome, a multipurpose 50,000 seat stadium opened in 1980. It was covered by a low-profile cable restrained air-supported fabric roof. The stadium structure including the air-supported roof was engineered by Geiger Berger Associates.

As the ptfe-coated fiberglass fabric of the Carrier Dome's air-supported roof was approaching the end of its service life, Syracuse University engaged Geiger Engineers to study concepts to replace the roof with a passive long-span structure. This study was completed in 2017 and following abandonment of a roof replacement developed by others, Geiger Engineers was engaged in 2018 to design and engineer a new roof for the Dome as the first phase of a staged renovation of the facility.

The unique circumstances, Client preferences, criteria, and constraints of replacing the roof structure of an existing stadium led to considerations not typically encountered in design of new facilities. Geiger Engineers had recent experience in the new roof for BC Place in Vancouver, BC which was invaluable in informing the design and development of the Carrier Dome new roof. The development of the primary long-span cablenet truss structure, the use of tension membrane, the selection of the type of tension membrane are all to be presented along with the construction of the new roof.