FYFE®

PROJECT PROFILE: STRUCTURAL STRENGTHENING TYFO® SYSTEM

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

Dueling Dinosaurs Exhibit

"Dueling Dinosaur" Fossil

Underside of Beams and Slab Coated in Fire Protection Prior to Installation of Tyfo SCH-41 System

OVERVIEW

The structural engineer of record determined that the reinforced concrete beams supporting this museum's floor needed to be strengthened to accommodate new loading – a 67-million-year-old fossil exhibit known as the "Dueling Dinosaurs!" Buried side by side during the Late Cretaceous period on a subtropical coastal plain in what is now Montana, the "Dueling Dinosaurs are among the most complete skeletons ever discovered of the two most iconic dinosaurs – Triceratops and Tyrannosaurus rex – including what is thought to be the only 100% complete skeleton of a T. rex known anywhere in the world.

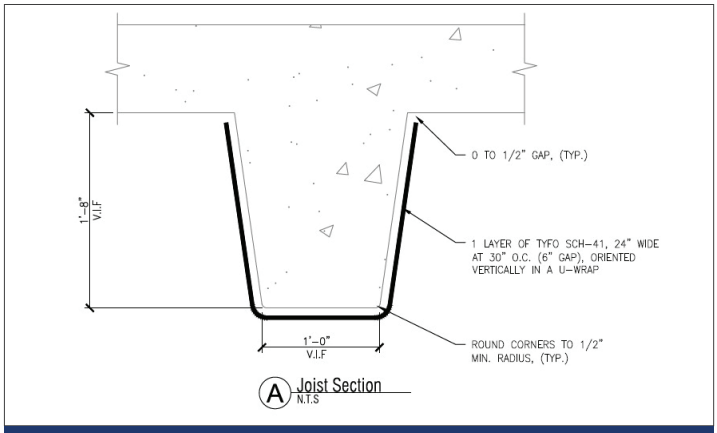
Such a monumental discovery warranted a state-of-the-art exhibit which, in turn, required an increase in the shear capacity of the supporting floor beams. Fyfe's Tyfo SCH-41 system was used to supplement the shear capacity of the existing reinforced concrete floor beams. This was accomplished by orienting the unidirectional carbon fiber system in a "U-Wrap," with the primary fibers running transversely to the axes of the beams.

Like all projects, this one was not without its challenges. The existing concrete beams were coated in a fire protection system, which needed to be removed prior to the installation of the Tyfo SCH-41 system. Adhesion testing was performed to confirm an adequate bond between the substrate and the Tyfo SCH-41 system. Witness panels were also created onsite and sent to an independent laboratory for ASTM D3039 testing to confirm the design properties of the Tyfo SCH-41 system.

Installation of Tyfo SCH-41 System

Fully Installed Tyfo SCH-41 System

Onsite Creation of Witness Panels for ASTM D3039 Tension Testing



Joist Strengthening Detail from Fyfe's Shop Drawings