IMAGE BY TRAHAN ARCHITECTS

ADVANCED ARCHITECTURAL STONE

1927
CAST STONE INSTITUTE®
CERTIFIED PLANT
PRODUCER MEMBER

PROJECT
Louisiana Sports Hall of Fame

LOCATION
Natchitoches, Louisiana

ARCHITECT
Trahan Architects

MASON
Masonry Arts

AWARD
CSI Award of Excellence

VISION

The 27,500 square foot Louisiana State Museum and Sports Hall of Fame building is located in Natchitoches, Louisiana, the oldest settlement of the original Louisiana Purchase. The museum houses memorabilia contributed by the diverse cultures that shaped the state of Louisiana and the Gulf South.

To celebrate the region's history, Trahan Architects envisioned the Cane river shapes inside the building spaces, leading the visitor through a meandering path of galleries and memorabilia. The architect's description of the design is "fluid shapes of the braided corridors of river channels separated by interstitial masses of land."

PROCESS

Beyond the design concept that contextualizes the museum in this historic town, the architect's goal was to enhance the flowing geometries of the interior spaces with a smooth stone finish - although it was clear that stone had never before been used on an installation of this geometric complexity and size.

Through conversations with the team at Advanced Architectural Stone (formerly known as Advanced Cast Stone) decisions were made early in the process to not use marble or granite, due to their long production process and high cost of labor. Instead, the team decided to use cast stone. Cast stone has faster production process; it also allows for fabrication of panels of minimum thickness.

The complexity of the project required the use of the latest technologies for design and production, including a highly coordinated BIM (Building Information Modeling) effort headed by CASE, Inc. in New York.

Fluid shapes of the braided corridors of river channels separated by interstitial masses of land.

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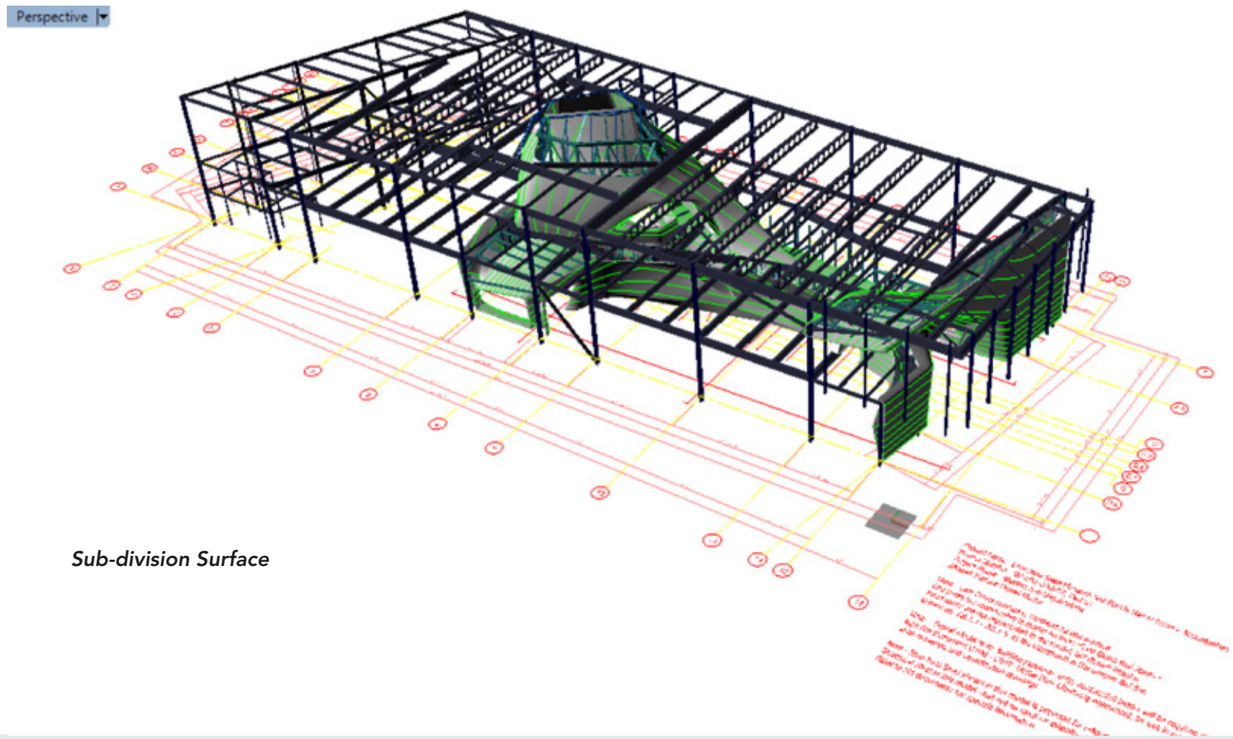
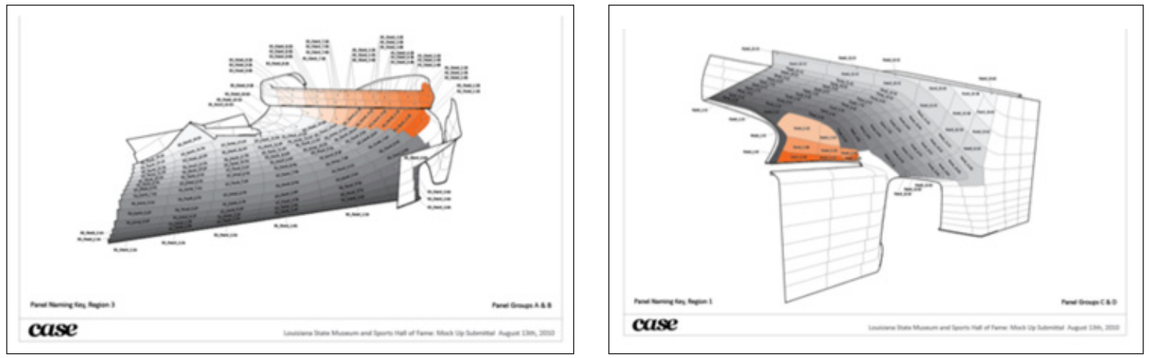


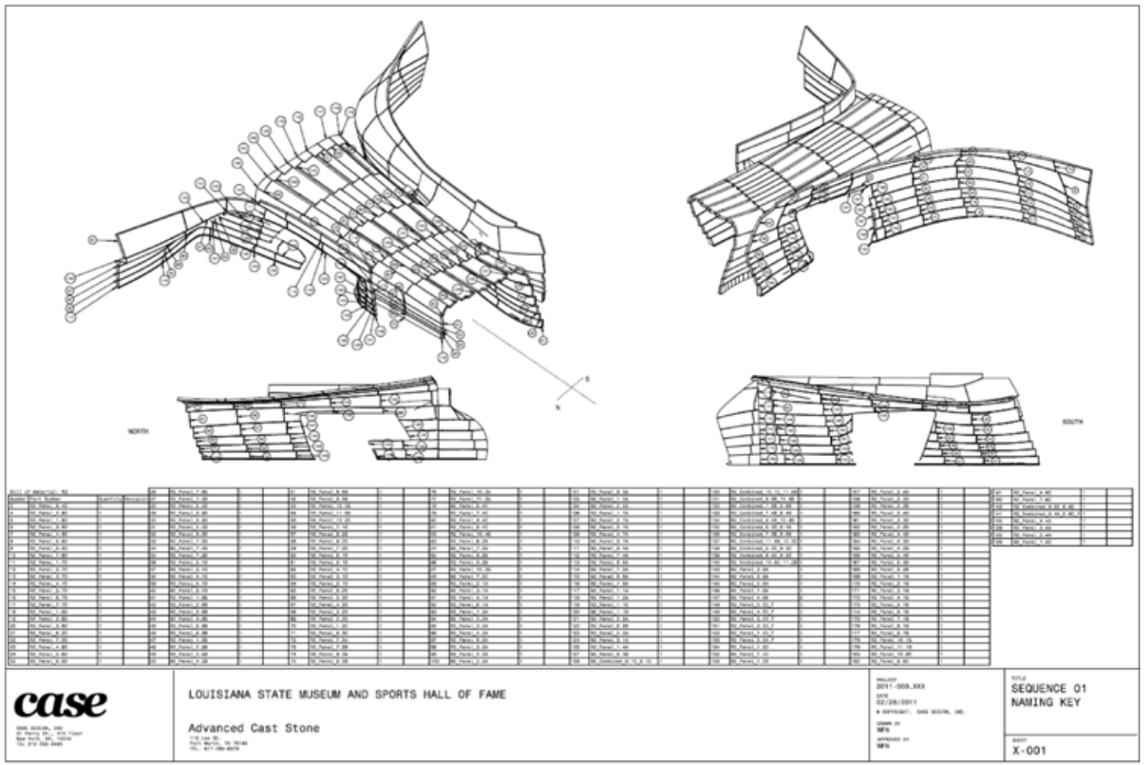
Sub-division Surface

The modeling of the project allowed for categorization and sequencing of the panels, geometry simplification, load bearing analysis, accurate location of anchor points on the panels, clash analysis, and accurate mold production for 1,250 unique panels. The molds were 5-axis CNC milled from high density foam finished with a hard coat to withstand the compressing forces of the manufacturing process for the cast stone panels. After the molds were produced, Advanced Architectural Stone (AAS) scanned each one to verify the tolerance requirements.

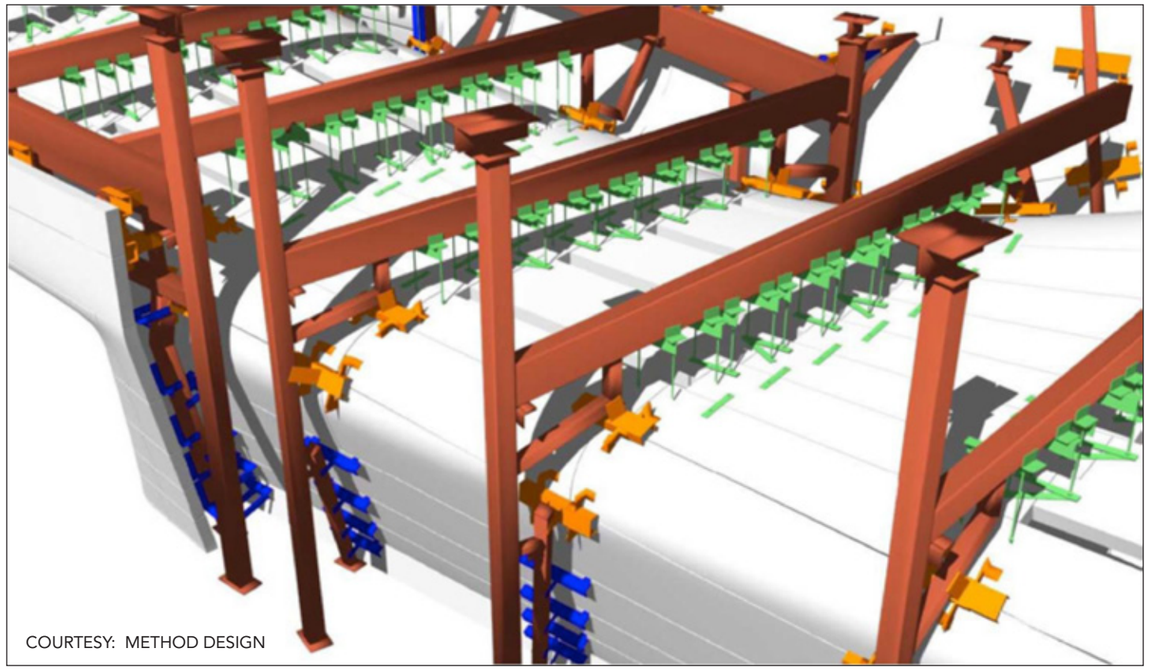
Once the tolerances were verified, AAS successfully fabricated each panel.



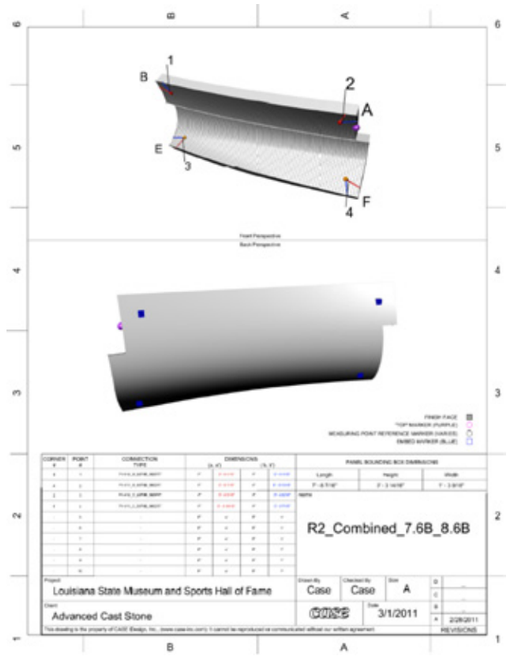
Codification – Organization of panels into regions

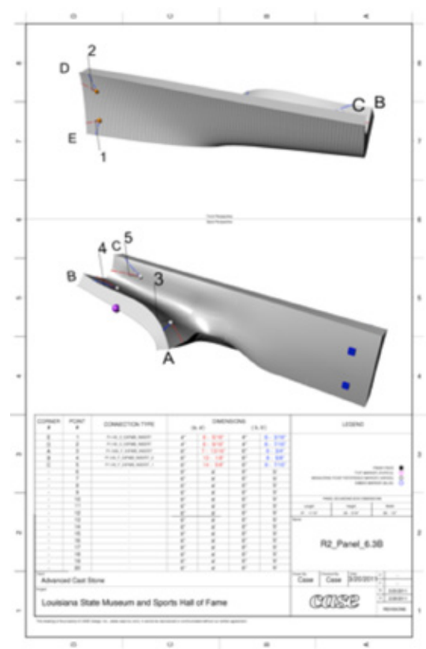


Codification – Panel key



Design – Connection and steel design





Shop tickets – panel fabrication data

Fabrication – Milling Test Forms

Fabrication – Half Molds

Fabrication – Two Part Mold

Fabrication – Mold Preparation

Fabrication – Finish Mock Up

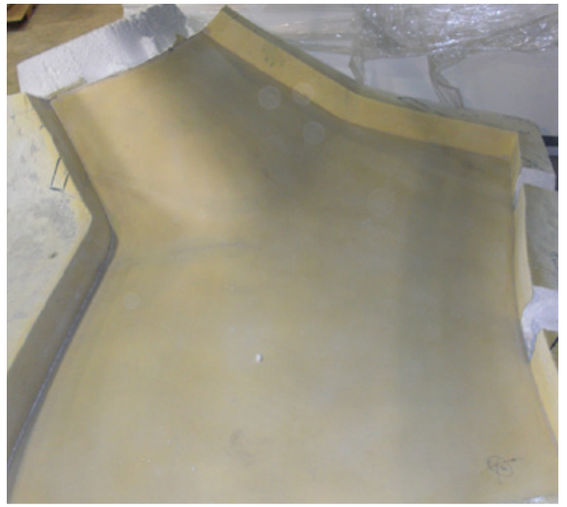
Mock Up – False Joint & Curvature

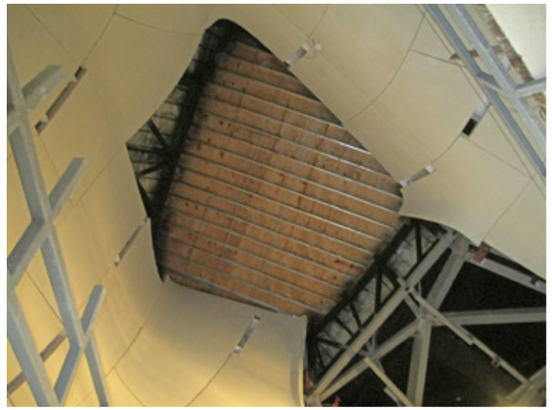
CASE developed the model for the surface of the complexly curved shapes. The AAS team designed every panel with required thickness and attachments used for the installation of each panel. AAS owned and successfully carried out the overall design of the structure.

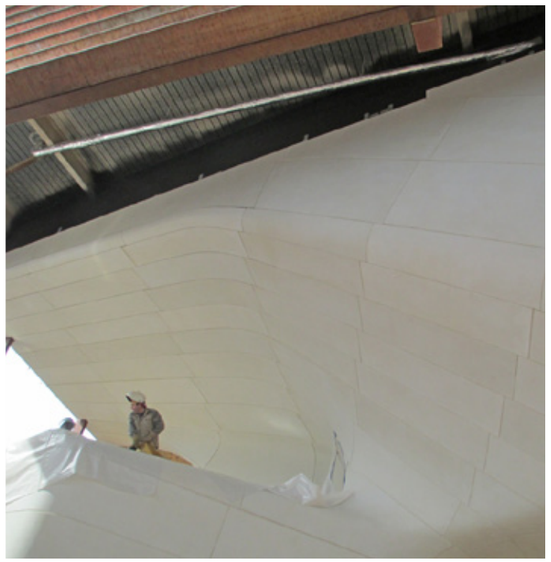
The cast stone pieces were all of irregular shape and often twisted on themselves in an extreme "U" shape. In addition, there were dimensional tolerances of less than +/- 1/8", a variation in length of +/- 1/8", and a warp, bow, and twist test of +/- 1/360 of length of unit, or 1/8". In addition, all 4,720 requirements were present. In order to comply with the stringent tolerance requirements, the company used specialty testing equipment to measure each surface area of the molds to prove they were within tolerance to all specifications.

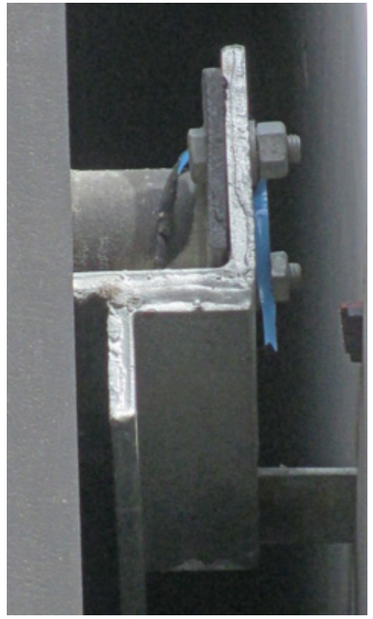
"One of the challenges with this project was that the back surface of the panels had to follow the front surface, as we were limited in wall space. We had to mold both the front and back of every panel. Our dry-cast methodology and expertise made a huge difference. Wet-cast needs pouring, so you would need a container that is extremely limiting for panels of such complex shapes and size. The biggest panel used in the building was about 18' x 12'; it weighed 9,600 lbs. A wet-cast panel in this case would weigh more than 16,000 lbs. Cast stone has tremendous design flexibility. With the CNC machines and BIM modeling technology that we have, we were able to complete project of this scale and complexity," says Tim Michael, VP of sales for AAS.

Eddie Lesok, CEO of AAS, emphasizes the ability of his team to take on projects that are big and complicated. "No other company in the bidding process could dedicate management staff to understand the project," he says. "While we were learning dramatically as the project progressed, our team's ability to collectively capture required knowledge, communicate, and collaborate put us in a position to succeed. For this kind of project, you need staff that knows technology and has a strong network to pull in right partners in the project."









"Advanced Architectural Stone pulled off an amazing feat. Faced with a completely new problem, they established a great team to help them deliver the product the architect wanted. They were able to communicate their process and craft to us in a way that allowed us to test out construction scenarios and validate the design. The end product is a testament to this collaboration. Everything fit like a glove, and it looks great."

– Federico Negro, Partner, ***case***

RESULT

The museum created an empowering appeal to pull patrons through different parts of the museum. It delivered on the vision of presenting this cultural heritage in a very engaging fashion.

Advanced Architectural Stone (AAS) won CSI Award of Excellence for this project.

IMAGE BY TRAHAN ARCHITECTS

CREDITS

Project: Louisiana State Museum and Sports Hall of Fame, Natchitoches, LA.

Client: State of Louisiana, Office of Facility, Planning & Control

Architect: Trahan Architects, New Orleans—Victor F. "Trey" Trahan, III, FAIA (design principal); Brad McWhirter, AIA (project architect); Ed Gaskin, AIA, Mark Hash, Michael McCune, AIA (designers); Sean David, Blake Fisher, Erik Herrmann, David Merlin, Assoc. AIA, Benjamin Rath, Judson Terry (project team)

Interior Designer: Lauren Bombet Interiors

Structural Engineer: LBYD

General Contractor: VCC

BIM Manager and Technology Consultant: CASE

Cast Stone Support Steel Geometry and Detailing: Method Design

Mason: Masonry Arts