



Aluminum Decking

Technology & Applications

AlumForum

Moscow

September 22, 2021

Overview

- AlumaBridge, LLC
- Benefits of Aluminum Bridge Decking
- Product Features
- Testing
- Applications
- Questions?

Leadership in Aluminum Bridge Decking

- AlumaBridge is the leader in design and supply of aluminum deck panels
- Exclusive access to critical manufacturing assets
- Recognized as authority in aluminum by North American bridge owners
- Ideal deck alternative for:
 - Moveable bridges
 - Structurally deficient bridges
 - Functionally obsolete bridges
 - Historic bridges



Solid Foundation & Well Positioned

- Successfully developed cutting-edge aluminum bridge deck technology
 - Friction stir welding (FSW) introduced in 2012, optimized in 2014
- Aluminum bridge decking tested and in service
 - 20+ years of successful performance history in U.S.
 - Aluminum deck R&D by various aluminum extruders since 1930's
 - AlumaBridge becomes first company to totally focus on aluminum decking
- AASHTO Code revisions to include aluminum were ratified in July 2012
 - *AASHTO is American Association of State Highway Transportation Officials*
- Growing interest in Canada
 - Project awarded in Quebec
 - Installation in 2015
- Florida DOT selects aluminum to replace steel open grid on bascule bridges
 - FDOT research shared with bridge authorities across North America
 - 5" deep decking delivered in February 2015

Benefits of Solid Deck Aluminum Panels

- Lightweight structural aluminum to reduce dead-load
- Prefabricated for accelerated bridge construction
 - Minimizes traffic interruptions and traffic control
- Lower lifecycle costs
- Advantages over existing lightweight deck alternatives
 - Corrosion resistant with minimal maintenance...*no painting!*
 - Better skid resistance and less road surface noise compared to grid decks
 - Mechanical deck-to-beam connections
 - Option to apply beams at the factory

Aluminum Deck Features

- Weight: 20.9 lbs./sq. ft. with ¼" wearing surface (two layers)
- Structural Efficiency
 - Composite or non-composite behavior with steel beams
 - HL-93 loading capable (highway bridge loading)
 - Designed for infinite fatigue life using AASHTO Specifications
 - Meets LRFD code (Load Resistant Factor Design)
 - Corrosion, chemical, and UV resistant

Aluminum Deck Features

- Maintenance Requirements
 - No painted or corroded surfaces
 - Wearing surface overlay can be applied in field (indefinitely sustainable)
- Constructability
 - Meets goals for Accelerated Bridge Construction (ABC)
 - Rapid deployment of lightweight panels
- Adaptability
 - Decks in service with beam spacing up to 9'
 - Potential to reuse existing beams

Aluminum Deck Features

- Wearing Surface
 - 2-part epoxy wearing surface with flintrock aggregate
- Functionality and Safety
 - Improved skid resistance (0.8 to 0.9 friction coefficient)



Aluminum Deck Features

- Specifications
 - AASHTO LRFD Section 7 Code incorporates aluminum
 - Revisions ratified on July 9, 2012 by T-14 Steel Design Committee
 - AWS D1.2 (American Welding Society) included FSW in June 2014

FDOT Study

Aluminum Decking to Replace Steel Open Grid



**BASCULE BRIDGE LIGHTWEIGHT SOLID DECK
RETROFIT RESEARCH PROJECT**

**DECK ALTERNATIVE SCREENING REPORT
FINAL**

FPID 419497-1-B2-01

Prepared for:



Florida Department of Transportation
Structures Design Office

Prepared by:

URS

URS Corporation, Inc.
7650 West Courtney Campbell Causeway, Suite 700
Tampa, Florida 33607

May 14, 2012

Test Program – FDOT Structures Research Center

- Thorough Testing – Acceptable to place test panels into service
 - Panels installed on North Causeway Bridge in Ft. Pierce, FL
- Visual/tactile inspection
- Structural testing
- Heavy Vehicle Simulation (HVS) with heavy moving wheel
- Wearing surface testing
- Accelerated corrosion testing



Test Program – FDOT Structures Research Center



FDOT Final Evaluation Report

Download Report at www.alumabridge.com



FLORIDA DEPARTMENT OF TRANSPORTATION
M. H. ANSLEY STRUCTURES RESEARCH CENTER
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2017

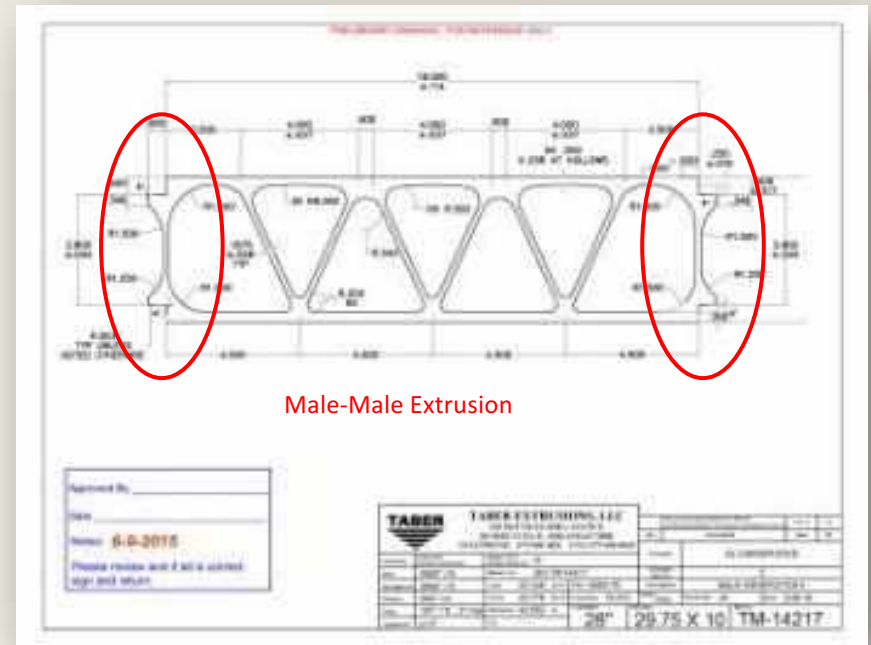
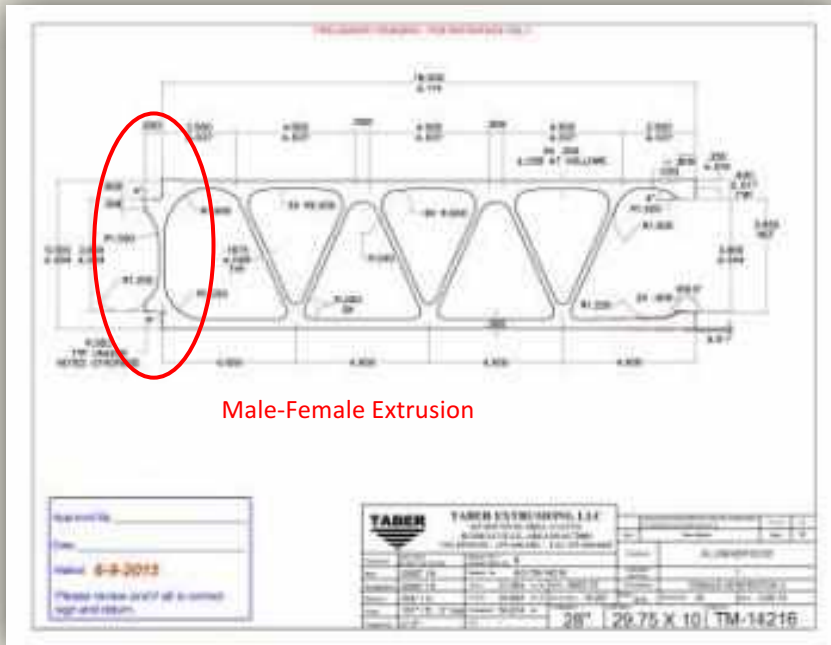
North Causeway Bridge

Ft. Pierce, FL



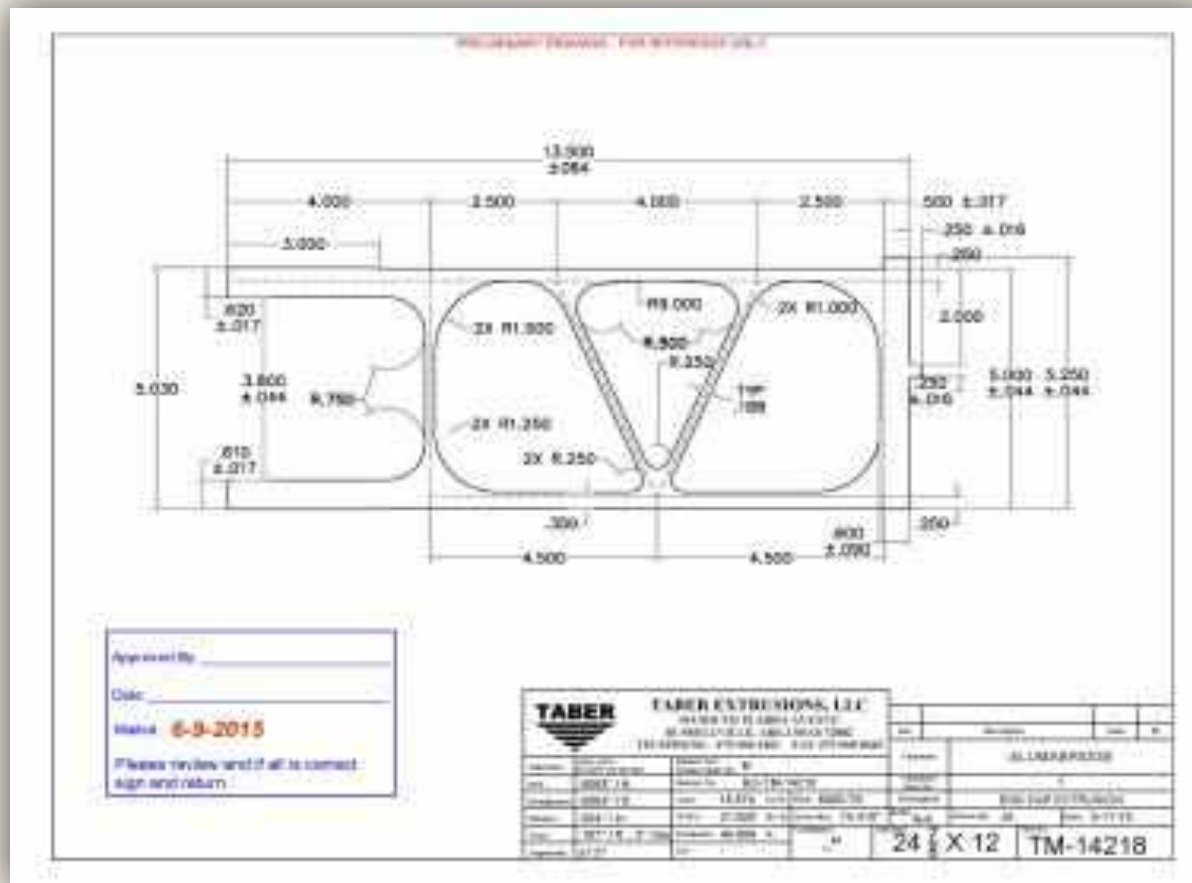
Aluminum Orthotropic Deck – Generation II Extrusions

- 6063-T6 aluminum alloy for improved extrudability
- Maximum length-to-date: 39.5' x 12.75' (Marine Parkway Lift Bridge)
- Base Extrusions: 5" deep x 18" wide
- Built-in backing for single-sided FSW to increase welding speed



Aluminum Orthotropic Deck – Generation II Extrusions

- End Extrusions: 5" deep x 13.5" wide



Friction Stir Welding (FSW)

- Metal stirred into plastic state
- Less heat-affected zone
- Joint is very ductile
- Joint is tougher than parent material



FSW Tool

5" Deep Deck



5" Deep Deck



5" Deep Deck



Sandisfield, MA Bridge *Completion & Shipment*



Sandisfield, MA Bridge

Lifting & Positioning: 15 minutes



Sandisfield, MA Bridge

Placement on Bearings: 15 minutes



“From crane to bearings in 30 minutes!”

Sandisfield, MA Bridge

April 21, 2015



St. Ambroise River Bridge

Quebec, Canada



St. Ambroise River Bridge

Quebec, Canada



St. Ambroise River Bridge

Quebec, Canada



St. Ambroise River Bridge

Quebec, Canada



Browns Park Swinging Bridge

Moffat County, Colorado



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Browns Park Swinging Bridge

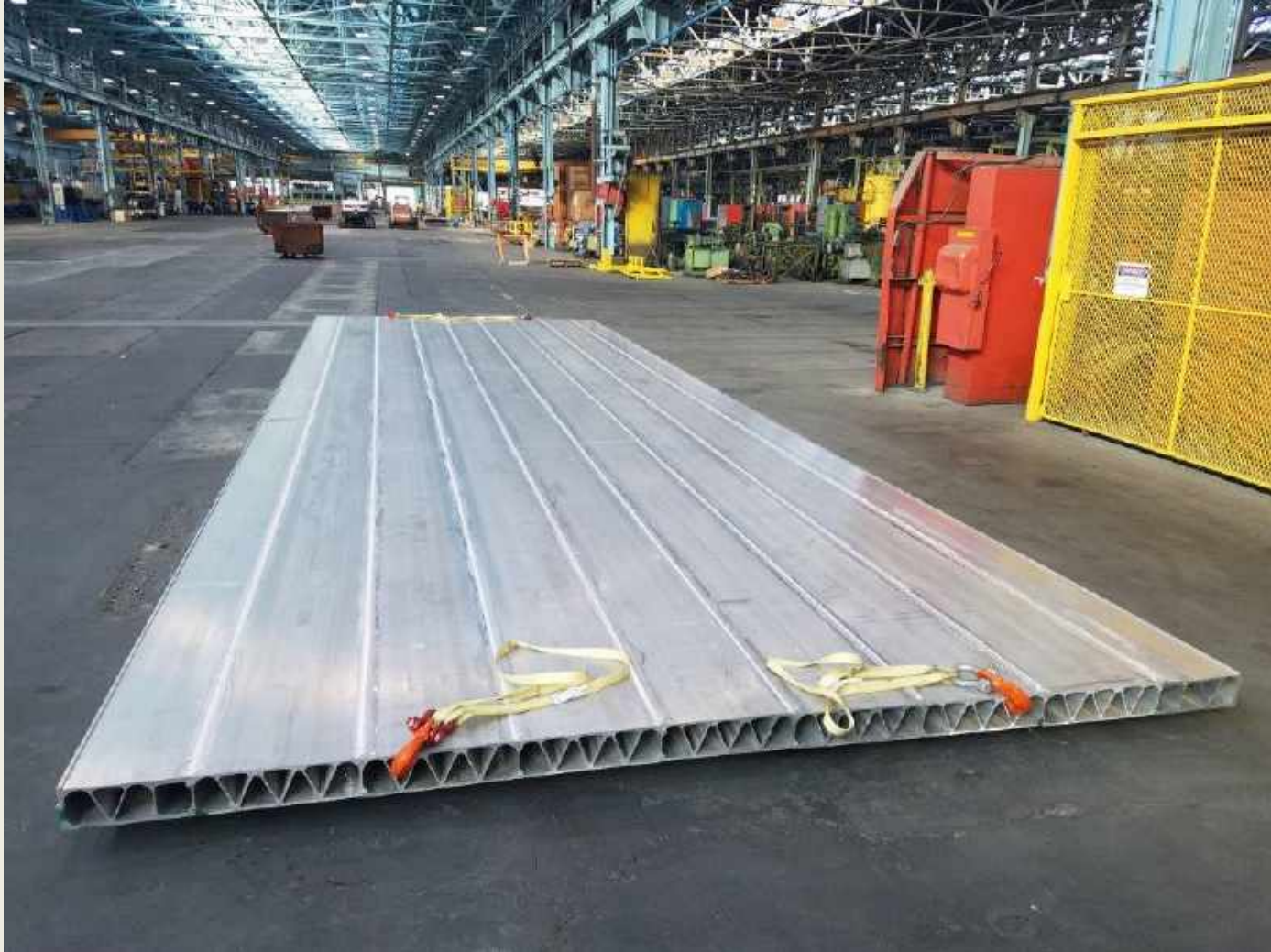
Moffat County, Colorado



Marine Parkway Lift Bridge (New York City)



Marine Parkway Lift Bridge (New York City)



Marine Parkway Lift Bridge (New York City)



Seabrook Nuclear Power Plant Bridge

Seabrook, NH

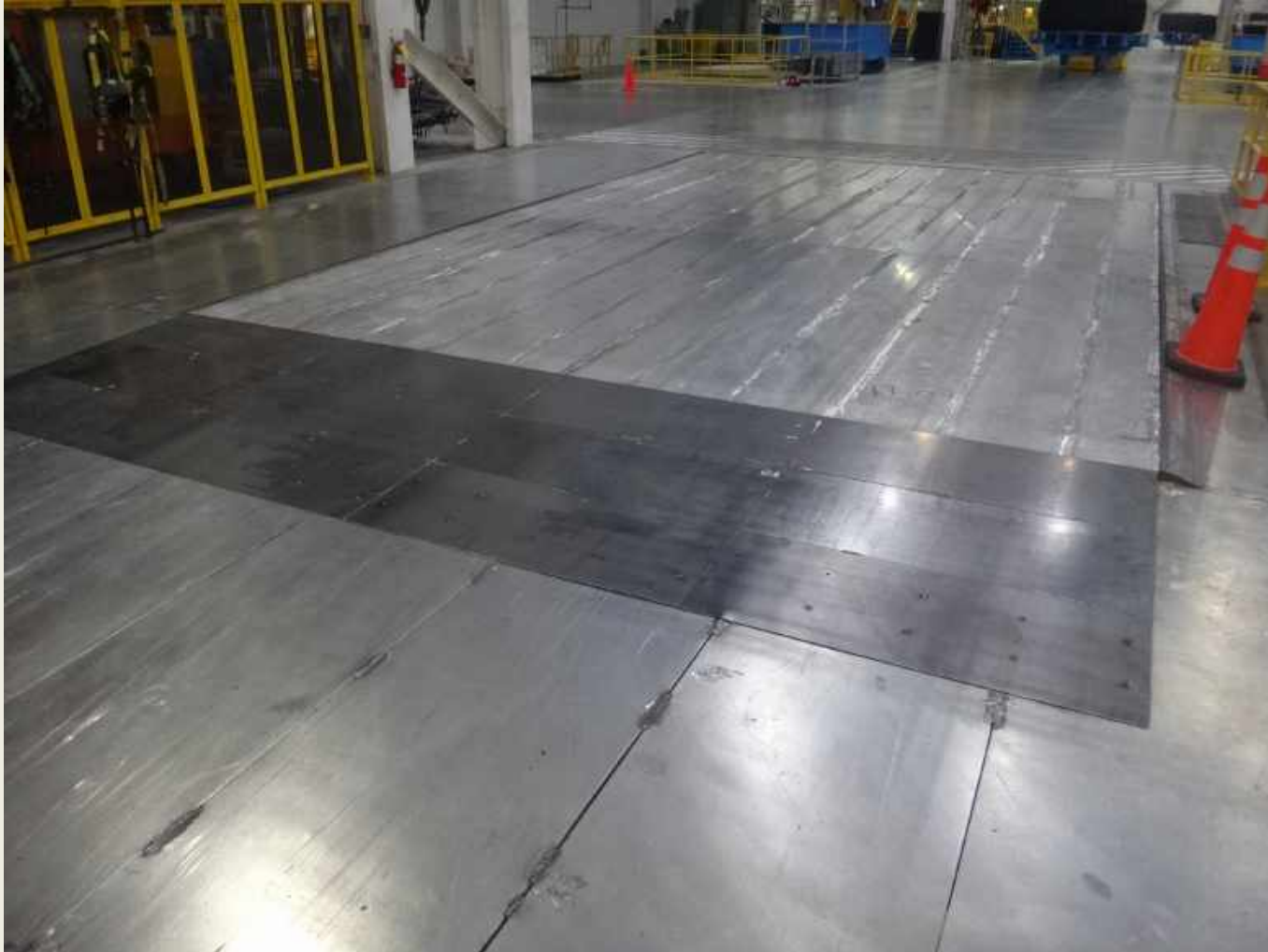


Seabrook Nuclear Power Plant Bridge

Seabrook, NH



Elevated Factory Floor



Elevated Factory Floor

Forklifts with Each Tire Exerting a Load of 35 Kips



AlumaBridge Decking

Engineered to Work in a Variety of Applications

- Roadway/Highway Bridges
- Moveable Bridges and Structures
- Emergency Deployment Bridges
- Temporary Bridges
- Prefabricated and Modular Bridges
- Portable Bridges
- Military Transportation Bridges
- Marine Decking
- Factory Flooring
- Construction Platforms

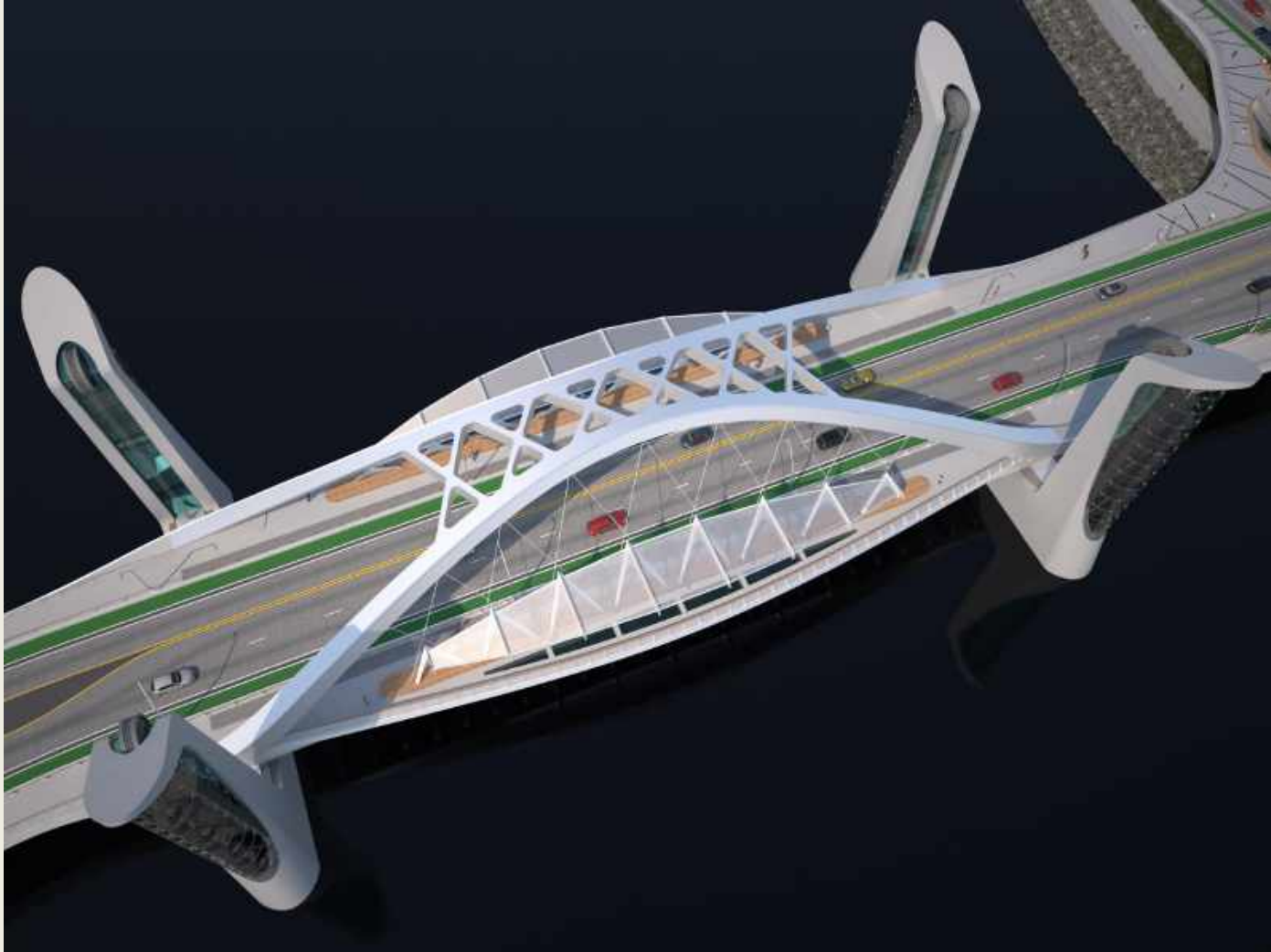
I Street Lift Bridge (New Construction)

Sacramento, CA



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Bridge Design & Engineering article on the benefits of structural aluminum and the selection of AlumaBridge Aluminum Decking for the I Street Bridge:

<https://www.bridgeweb.com/Spring-in-Sacramento/7302>

Product Licensing

- A path to global expansion
 - Patents already in place:
 - United States
 - Canada
 - Europe
- Currently in the process of setting up product licensing in:
 - China
 - Europe
- Seeking companies/partners for product licensing globally

Contact Info



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Thank You!

Questions?