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NASCC: The Steel Conference

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Steel and Fire: What's Changed in 2022?

Presented by: Kristi Sattler, Amit H. Varma

AIA Information:

NASCC2022-E22

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/23/2022, 10:15 AM– 11:15 AM

Expiration Date – 2/8/2025

Course Description:

This presentation will be broken down into three mini-presentations. Topic 1 - Overall Changes and Additions to the Design by Qualification Testing: This presentation will summarize all the major changes to App. 4 with particular emphasis on the extensive additions made in Section 4.3 (design by qualification testing) for prescriptive design, and the addition of design provisions for composite columns and walls (SpeedCore). Topic 2 - Steel Material Models and Design by Simple Methods of Analysis: This presentation will discuss the changes to the steel material models in Appendix 4, and the improvements made to the design by simple methods of analysis. A design example will be used to showcase the use of the simple method of analysis. Topic 3 - Design by Critical Temperature Method, and Ongoing Large-Scale Fire Tests: This presentation will discuss the newly added design by critical temperature method to Appendix 4 using examples. The presentation will also summarize the results from the ongoing large-scale steel structure fire tests at the NIST NFRL.

Learning Objectives:

1. Explain the difference between the simple and advanced methods of analysis
2. Describe how to determine the fire resistance rating for a concrete-filled composite plate shear wall
3. Define the critical temperature of a structural steel member
4. Analyze the results from the ongoing large-scale steel structure fire tests at the NIST NFRL.



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Case Study of the Erection of the Nancy and Rich Kinder Building

Presented by: James Byrum, Adam Friedman

AIA Information:

NASCC2022-G3

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/23/2022, 11:30 AM– 12:30 PM

Expiration Date – 2/8/2025

Course Description:

The Nancy and Rich Kinder building in Houston has more than 100,000 square feet of exhibition space for art from the MFAH collection. The building is comprised of a cast-in-place concrete shell divided into six segments that surround a central atrium. The complex lower structure includes second level girders that cantilever out and support braced-frame columns that in turn support level three and the roof framing. The roof framing consists of a network of complex pipe trusses that interweave to create a web of concave roof leaves. The infill framing between the trusses is comprised of beams that form vertically bowed members that follow the contours of the concave roof. The infill framing is part of a two-way floor system that acts as a rigid grid. Temporary shoring and sequence of erection was carefully engineered to address deflections resulting from third level and roof loads transmitting into the second level members. Significant planning was focused on the roof framing including in-depth staged construction analyses. Stability of the partially completed structure, temporary shoring of the roof structure, fit-up of trusses and other framing, and installation of decking to match the roofs contour were all concerns that the erector and erection engineer worked to overcome. Early planning and coordination between erector, erection engineer, fabricator, contractor, and design team was critical to the success of the project.

Learning Objectives:

1. Explain the importance of critical analysis and execution planning for complex structures.
2. Explain how temporary shoring played a critical role in addressing deflections resulting from third level and roof loads transmitting into the second level members.
3. Describe the significance of in-depth staged construction analyses for the roof framing.
4. Describe the benefits of early planning and coordination between erector, erection engineer, fabricator, contractor, and design team.



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Structural Enablers: Selected Structural Steel Innovations in the Work of Diller Scofidio and Renfro

Presented by: Brian Tabolt

AIA Information:

NASCC2022-A1

1 LU

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/23/2022, 1:45 PM– 2:45 PM

Expiration Date – 2/8/2025

Course Description:

This talk will cover how structural innovation using steel has supported investigations of complex programmatic, social, and environmental relationships in the work of selected projects of New York based interdisciplinary studio Diller Scofidio and Renfro. Senior Associate Brian Tabolt will present some of the work he has led there over the past decade, including At DS+R, the Tianjin Juilliard School, the Stanford McMurtry Art and Art History Building, Zaryadye Park in Moscow, and DS+Rs competition winning scheme for the New Museum of Transport in Budapest, scheduled to open in 2023. Tabolts father, Glenn Tabolt, is a professional engineer and Chief Executive Officer of STS Steel, Inc. Brian will also walk us through a discussion of how his exposure to the steel industry from an early age has influenced his relationship with structural engineers and fabricators.

Learning Objectives:

1. Evaluate ways in which one may borrow from related industries to improve the design process.
2. Understand the different phases of the design process, from SD, DD, to CD's and how/when to work with stakeholders through each of the phases.
3. Evaluate pathways to implement understanding of the steel fabrication process into the development of architectural design.
4. Understand the typical expectations and best practices of an architect when working with engineers and fabricators to influence a design outcome.



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Case Study: The Steel Cocoon: A Case Study in Creative use of Steel as a Solution in the Restoration of the Air Force Academy Chapel

Presented by: Nat Killpatrick, Donny Tennison, Matt Burger, Brandon Ford, Austin Jones

AIA Information:

NASCC2022-G5

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/23/2022, 3:00 PM– 4:00 PM

Expiration Date – 2/8/2025

Course Description:

Facing a three-year and \$158 million dollar renovation, the contractor, JE Dunn, had a problem to solve. How do you perform a top down, full historical renovation on a major significant structure and protect it from the elements over the course of the process? The answer was to build a structure to completely encapsulate the work envelope during the renovation but make it something that can be disassembled and removed when the improvements are complete.

Learning Objectives:

1. Explain the issues with the Chapel's current construction challenges in performing the remodel that led to the need for an enclosure.
2. Describe the process to determine the best structural solution for enclosing the project.
3. List considerations in planning for other trades.
4. Describe the advantages of the industrial wrap used.



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Hotel Julian Chicago: 5 Story Addition Atop a 12 Story Steel Structure from 1912

Presented by: David Nickell

AIA Information:

NASCC2022-G7

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/24/2022, 9:45 AM– 10:45 AM

Expiration Date – 2/8/2025

Course Description:

The Hotel Julian renovation and addition included unique structural challenges to transform a severely deteriorated 12-story steel office building into a 17-story boutique hotel located along Chicago's famed Michigan Avenue street wall. Key to the success of the project was a great partnership between ownership, the design team, and the contractor. This talk will focus on the process of evaluating the existing steel structure originally built in 1912 as an office building that had recently been left to disrepair. Significant field testing was required for substructure and superstructure verification along with in-field review of uncovered deterioration throughout the project. Additionally, the gravity and lateral system had to be reinforced to accommodate the new gravity and lateral loading of the vertical expansion.

Learning Objectives:

1. List the structural challenges encountered in the renovation of a 1912 steel building.
2. List the types of evaluation utilized in this renovation.
3. Explain different structural reinforcement alternatives for strengthening an existing building.
4. Describe the changes made to the existing lateral system to account for the vertical expansion.



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Emerging Architects Take on the Future of Design and Construction in Steel

Presented by: Rosannah Harding, Matthew Ostrow

AIA Information:

NASCC2022-A2

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/24/2022, 11:00 AM– 12:00 PM

Expiration Date – 2/8/2025

Course Description:

As one of the major structural building materials available, steel has an important role to play in the design process of our future architects. Follow the work of two intrepid design leaders as they tread the world of architecture in steel. Rosannah Harding and Matthew Ostrow, of HardingOstrow Architects, winners of the 2020 Forge Prize, bring us an interesting look into the theory and visions of steel design through the eyes of young architects. The pair will share insights and points of view on their craftwork and resiliency studies with steel projects. This session will also touch on key steel design and construction trends affecting the practice of architecture and what adaptability looks like within the context of the built environment and professional practice.

Learning Objectives:

1. Evaluate ways in which one may borrow integrated technology for efficient steel construction.
2. Review the recent accomplishment of the steel industry in terms of observing sustainable principles.
3. Analyze the interrelationship of resilient design and impact on community.
4. Contextualize and understand, through project examples and investigative design theory, the impact of trends within the practice of architecture.



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Sustainable Steel - What the Mills Are Doing

Presented by: Sonny Crews, Brad Fletcher, Jamie MacPhail, David Miracle

AIA Information:

NASCC2022-I5

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/24/2022, 11:00 AM– 12:00 PM

Expiration Date – 2/17/2025

Course Description:

Nearly 90% of fabricated structural steel's carbon footprint occurs at the mill level - before material ever reaches the fabricator. Come hear directly from the major domestic structural mills about what they are doing to minimize structural steels environmental impacts.

Learning Objectives:

1. List the efforts by mills to reduce structural steel's carbon footprint.
2. Explain how steel production uses recycled water to reduce its environmental impact.
3. Compare the footprint of American-made steel to other major steel-producing countries.
4. Compare steel's carbon footprint to other building materials.



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The 2022 Forge Prize Recipient: This Year's Winning Design Presentation

Presented by: Alex Morales

AIA Information:

NASCC2022-A3

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/24/2022, 1:45 PM– 2:45 PM

Expiration Date – 2/8/2025

Course Description:

The Forge Prize is a conceptual design competition established by The American Institute of Steel Construction in 2018 to recognize visionary emerging architects for designs that embrace steel as a primary structural component and capitalize on steel's ability to increase a project's speed. The competition looks for intrepid versions of the future. What will people build with, live in, work in, or play in? This session brings us an inspiring presentation by the 2022 Forge Prize Recipient showcasing not only the imaginative and boundary-pushing possibilities of designing with steel but also why the expertise and collaboration of steel fabricators is vital in the design process.

Learning Objectives:

1. Evaluate strategies to efficiently utilize structural steel to minimize carbon footprint and promote healthy environments.
2. Identify and implement design strategies that leverage the expertise of the steel industry for optimized project outcomes.
3. Contextualize ways in which designers can capitalize on structural steel design approaches to derive safe buildings that promote the general welfare of the public through whole building life cycle considerations.
4. Understand the role of emerging architects in proposing and executing innovative designs and buildings within the context of impact to community welfare.



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AISC and the Steel Industry: 100 Years of Innovation

Presented by: Charlie Carter

AIA Information:

NASCC2022-I3

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/24/2022, 1:45 PM– 2:45 PM

Expiration Date – 3/3/2025

Course Description:

One hundred years ago a group of visionaries saw the need to unify and standardize codes and practices for steel design and construction, and advance steel through marketplace promotion; AISC was born. During the past century, AISC's standards and related information have helped the design community and steel construction industry advance the state of the art for both buildings and bridges. The progression over that time in materials, design, fabrication, erection, and technology is staggering! In this fast-paced presentation, AISC President Charles J. Carter, SE, PE, PhD, will look at the past, the present, and the future of the world of steel.

Learning Objectives:

1. Establish a benchmark for state-of-the-art design and construction.
2. List examples of advances in technology that over the past three decades, have led to the steel industry reducing greenhouse gas and overall emissions
3. Historically speaking, explain how unifying and standardizing the codes and practices for steel design advance the safety and efficiency of steel design and construction.
4. List examples of how technology has positively affected innovation, efficiency, and safety in steel design and construction.



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Reimagined in Steel: Charles Library at Temple University

Presented by: Eddy Roberts, Joel Chandler

AIA Information:

NASCC2022-G9

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/24/2022, 1:45 PM– 2:45 PM

Expiration Date – 2/8/2025

Course Description:

The Charles Library showcases impressive open interior spaces and expressive cantilevers over the building's entrances made possible by its steel structure and thoughtful detailing. Although steel is the natural choice for the long cantilevers, surprisingly, the rest of the structure was originally envisioned, designed, and bid as a concrete structure. After construction bids came in well over expectations, a major redesign was required at the start of construction, which, among other changes, included pivoting the building's structure to mostly steel. This presentation will tell the story of how the steel redesign was achieved in mere weeks rather than months or years to maintain the project's schedule and to allow the building to open as planned for the fall semester in 2019.

Learning Objectives:

1. Explain the decisions that influenced the design of the Charles Library.
2. Describe why the design team initially considered a concrete structure.
3. Identify the impacts of value engineering the design from concrete to steel.
4. Describe the detailing of the complex portions of the steel structure.



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Build Teamwork that Works to Win

Presented by: Dan Coughlin

AIA Information:

NASCC2022-Z2

1 LU

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/25/2022, 8:00 AM– 9:00 AM

Expiration Date – 12:00:00 AM

Course Description:

This session focuses on how you as a manager can create effective group dynamics that emphasize a healthy culture, a clear common meaningful purpose and important measurable outcomes, and the vulnerability necessary to work together successfully toward the fulfillment of that purpose and the achievement of those goals.

Learning Objectives:

1. Understand the difference between a team and a committee.
2. How to maintain urgency in the absence of an emergency.
3. Establish practical operational strategies and clear plans to execute to achieve a long-term vision. In other words, learn how to land the planes of big ideas on a consistent basis.
4. Explain how culture and meaningful purpose drive successful projects.



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Life Cycle Analysis (LCA) for Steel Buildings

Presented by: Don Davies

AIA Information:

NASCC2022-I6

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/25/2022, 8:00 AM– 9:00 AM

Expiration Date – 2/17/2025

Course Description:

This session will focus on embodied carbon and life cycle analysis of steel buildings. It will also provide insights on the EC3 Tool, a tool used to monitor a material's carbon footprint through the design and construction phases of a project. Strategies for reducing steel's carbon footprint through sourcing and recycled materials will also be discussed.

Learning Objectives:

1. Understand why embodied carbon is an important consideration when selecting building materials.
2. Learn about the EC3 tool and how it can be used.
3. Understand what LCAs tell us about a building material.
4. Evaluate Environmental Product Declarations for steel products.



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Revitalizing a Classic

Presented by: Matt Farber, Brian MacRae, Shawn Leary

AIA Information:

NASCC2022-G12

1 LU | HSW

Prerequisites – None

Instructional Method – Live

Session Date & Time – 3/25/2022, 9:15 AM– 10:15 AM

Expiration Date – 2/17/2025

Course Description:

The clever part of the Climate Pledge Arena renewal was the preservation and upgrade of the historic 1962 roof and facade and the connections between the existing support members and the new below-grade structure. But the secret sauce was just as much how the work was done, with a seamless collaboration of the contractor, architect, engineer, and fabricator. Here we look at what made this job a success, and what lessons we can take to the next job.

Learning Objectives:

1. Describe how historic landmark designation shaped designed decisions on a remodel of the structure.
2. Explain how the arena will become the first net-zero carbon certified arena in the world.
3. Explain the structural system used during construction to support the existing roof.
4. List tools that the construction and design team used to ensure design, and construction efforts worked in unison to deliver this unique project to completion.