22ND ANNUAL

22ND LCI CONGRESS
OCTOBER 19-23

LeanSteel™ - Flattening the Supply Chain in Structural Steel Delivery

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Todd Lackey – Sr. Project Manager, Ruby+Associates, Inc.

THE ABC'S OF LEAN: TRANSFORMATION THROUGH ACTIONS, BEST PRACTICES AND COACHING

OCTOBER 20, 2020 – 12:35PM

Presenters

John Matuska, PE, DBIA

Principal, Ruby+Associates

Todd Lackey

Senior Project Manager, Ruby+Associates

Introduction

Lean Construction Institute
Transforming the Built Environment

Ruby+Associates, Inc. Structural Engineers

- Founded in 1984 by Dave Ruby, PE, SE
- Firm's Philosophy: Constructability
- 50 Professionals
- 2 Locations in Michigan
- Licensed as Professional Engineers and Structural Engineers in 43 States, 3 Provinces

Problem Statement

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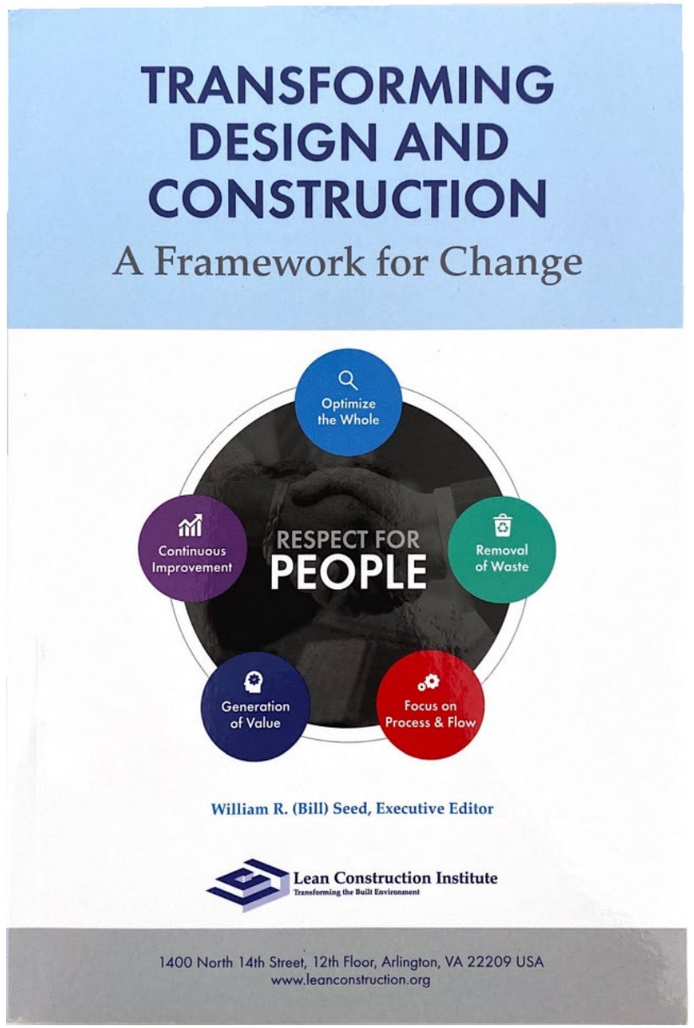
Traditional Structural Steel Delivery

Problem Statement

- "…50% or more of the effort required to deliver a built environment is non-value added effort, or waste…"



Problem Statement

- Seven Common Wastes (TIMWOOD)
  - Transportation
  - Inventory
  - Motion
  - Waiting
  - Over Processing
  - Over Production
  - Defects

- The traditional Steel Design, Detailing, and Fabrication model/process is full of at least 6 of these 7 wastes!

Problem Statement

Problem Statement

- The traditional structural steel design and delivery model is not Lean!
- The LeanSteel™ steel design and delivery method utilizes an integrated design and detailing process to expedite project schedule, allowing better coordination with advanced BIM models and reducing the administrative burden on the team.

Traditional Steel Design & Delivery

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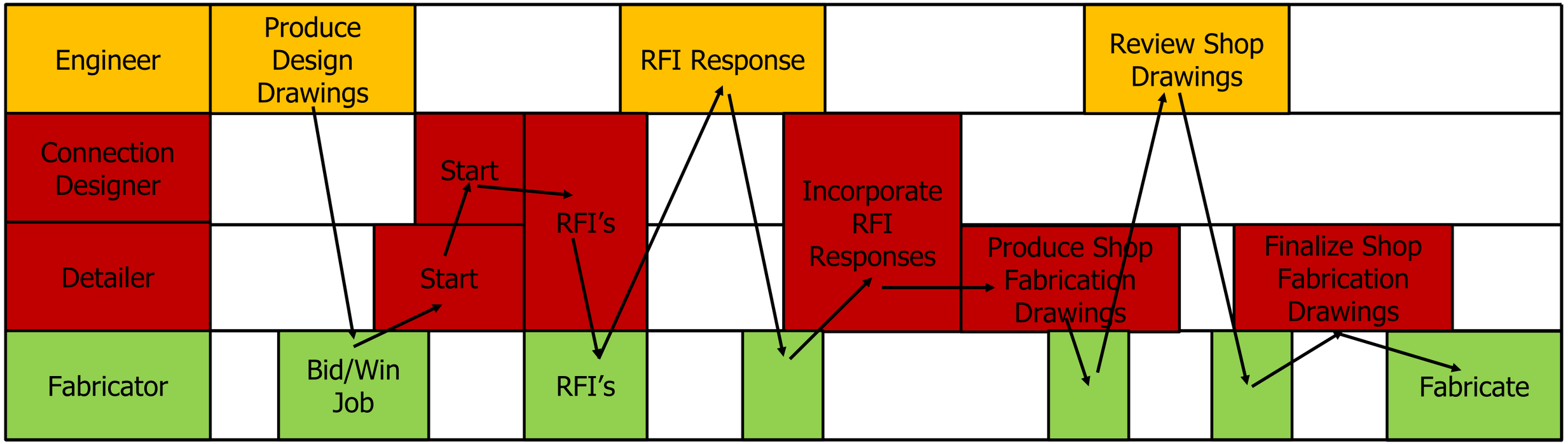
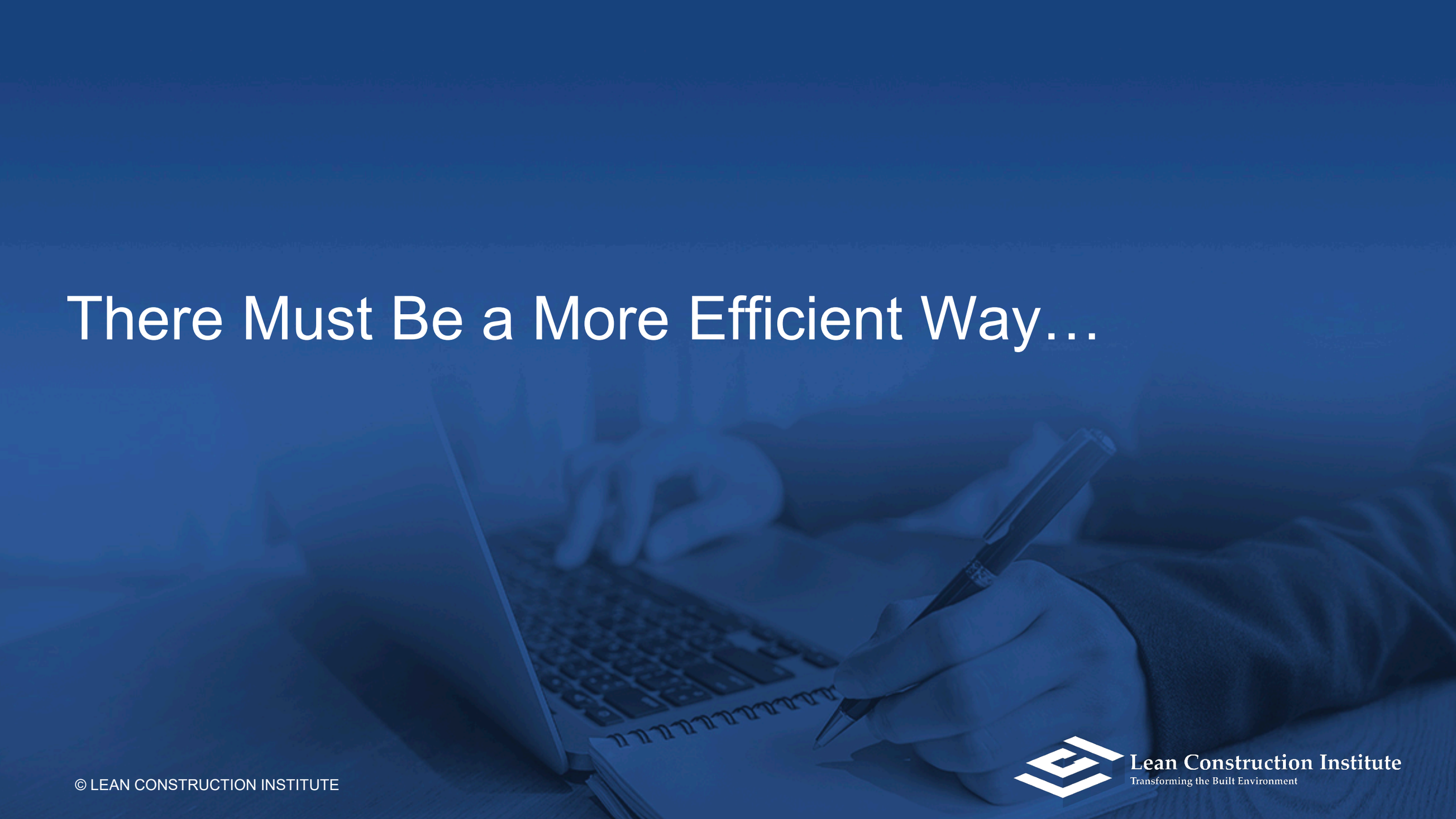
Steel Design & Delivery: The Traditional Method



There Must Be a More Efficient Way…



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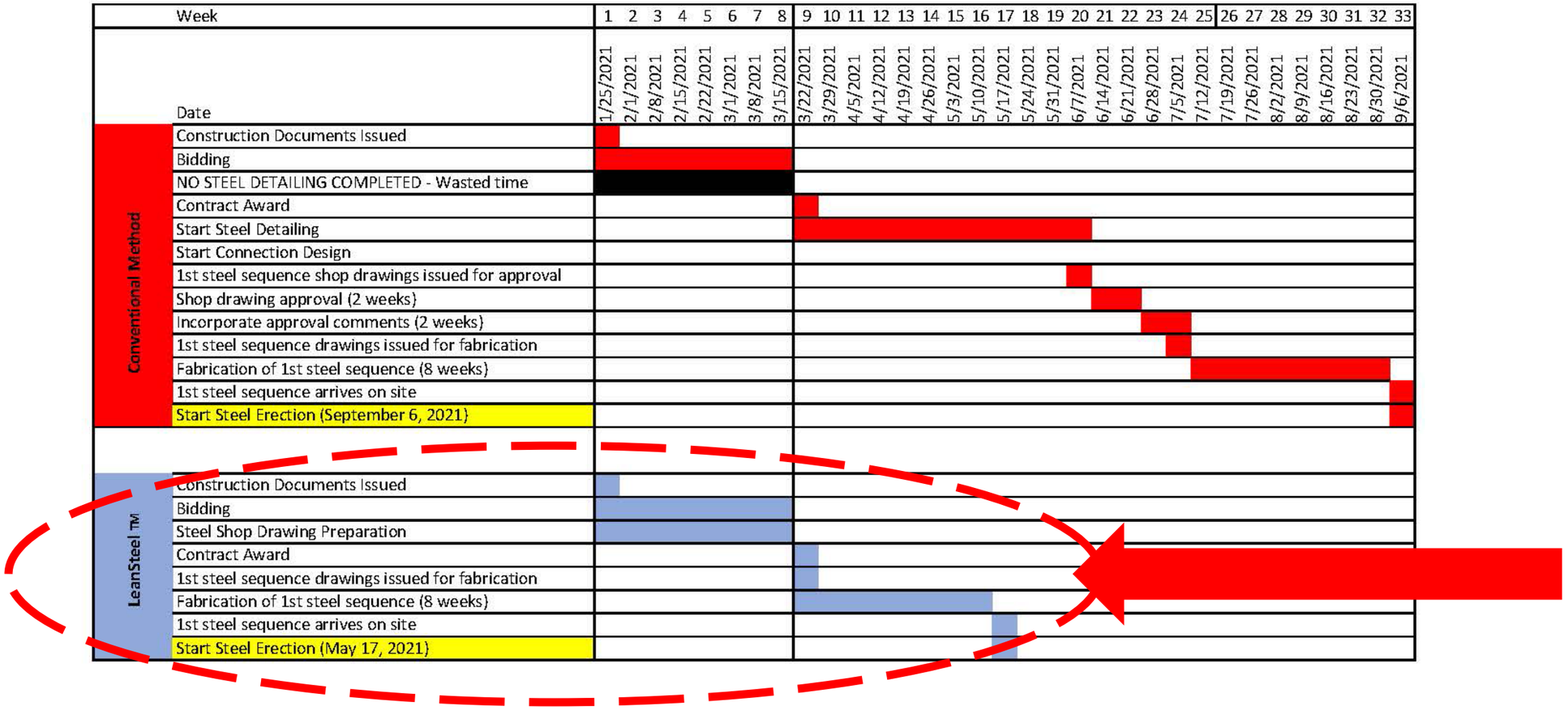
LeanSteel™ Delivery Method

- Ruby serves as SEoR, Connection Designer & Detailer
- Ruby's engineers produce a fully coordinated and detailed model (deliverable) for the steel fabricator
- Avoids wasted time and lost knowledge
- Compresses schedule, less steps… LOWER CONSTRUCTION COSTS

LeanSteel™	Design & BIM Modeling	Produce Sample Shop Drawing Package	Collaborate & Incorporate Comments	Finalize Connection Design & Shop Fabrication Model		
Fabricator		Review Pricing, Collaborate & Provide Comments			Fabricate	12-16 Week Savings

LeanSteel™ Delivery Method

- LeanSteel™ flattens the steel supply chain and increases project success.



General Motors Body Shop Program: LeanSteel™ Success

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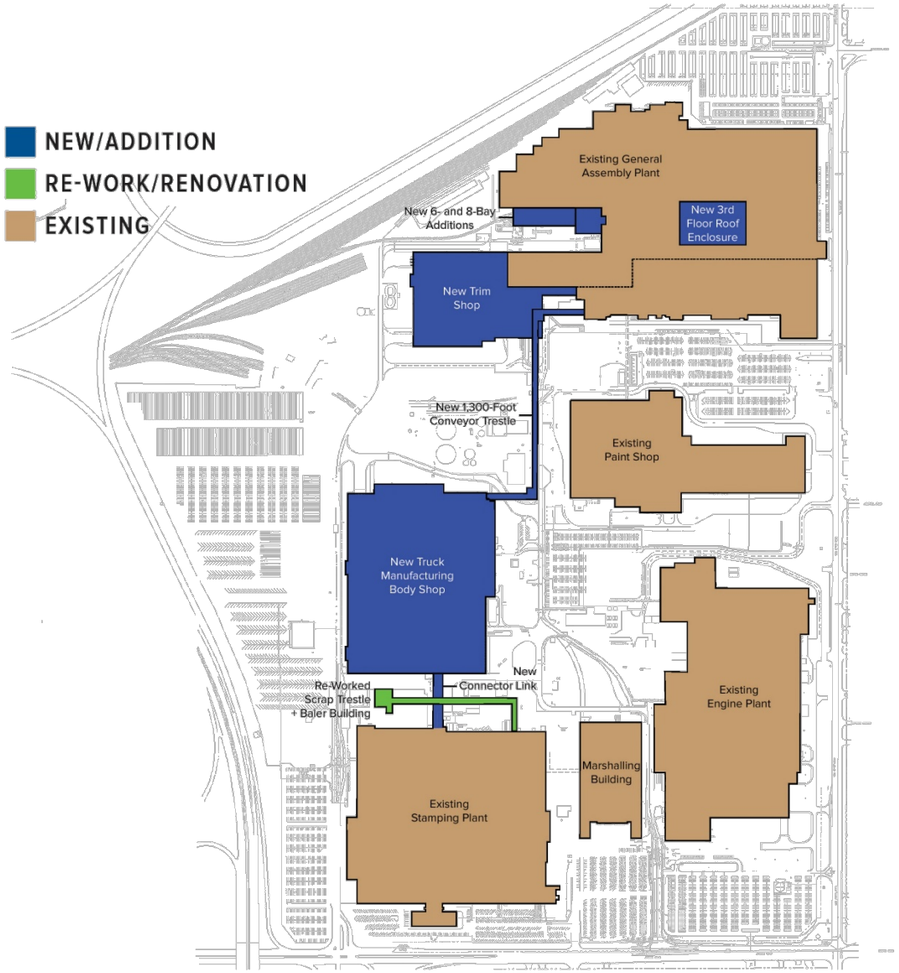
General Motors Body Shop Program

- New Manufacturing Body Shops
- Four Sites: Flint, MI; Ft Wayne, IN; Arlington, TX; Silao, MEX
- Design-Build Team Co-Location at Barton Malow Company
- Aggressive 2-Year Schedule
- 4 Million+ SF of Structure
- 40,000+ Tons of Steel



Flint, Michigan Site

LeanSteel™ Delivery Method

Design Phase:

- Fabrication model started on “Day One”
  - DD’s produced from same model
  - Not waiting for fabricator award
  - Early clash detection with other design disciplines
- Mill roll schedule is used for determining proper member size
- Constructability issues/concepts discussed with construction team

LeanSteel™ Delivery Method

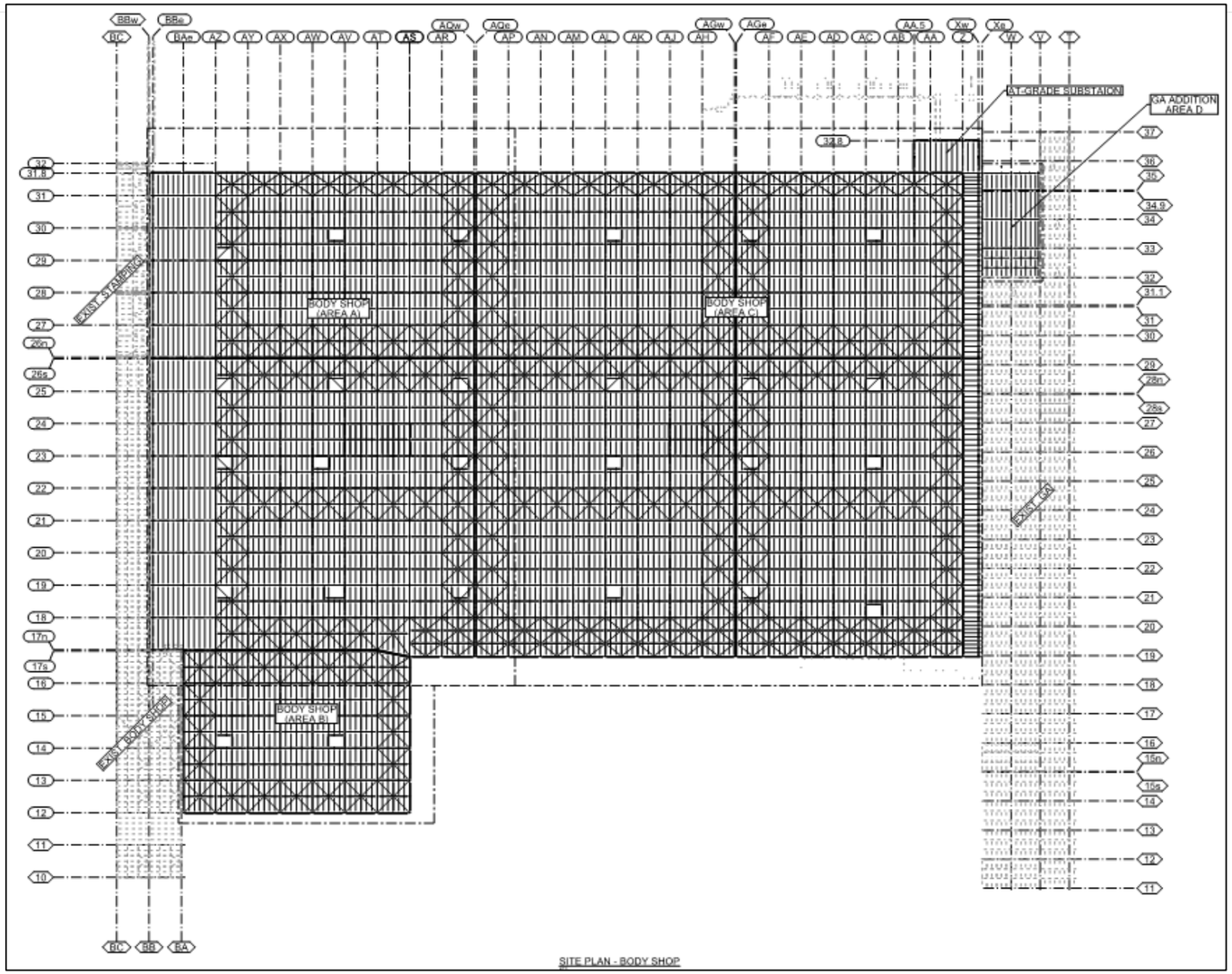
Post Design Phase:

- CD’s and Specifications
- LOD 300/350 Model
- Phased and lotted model, by erection sequence

LeanSteel™ Delivery Method

Post Design Phase (Cont.):

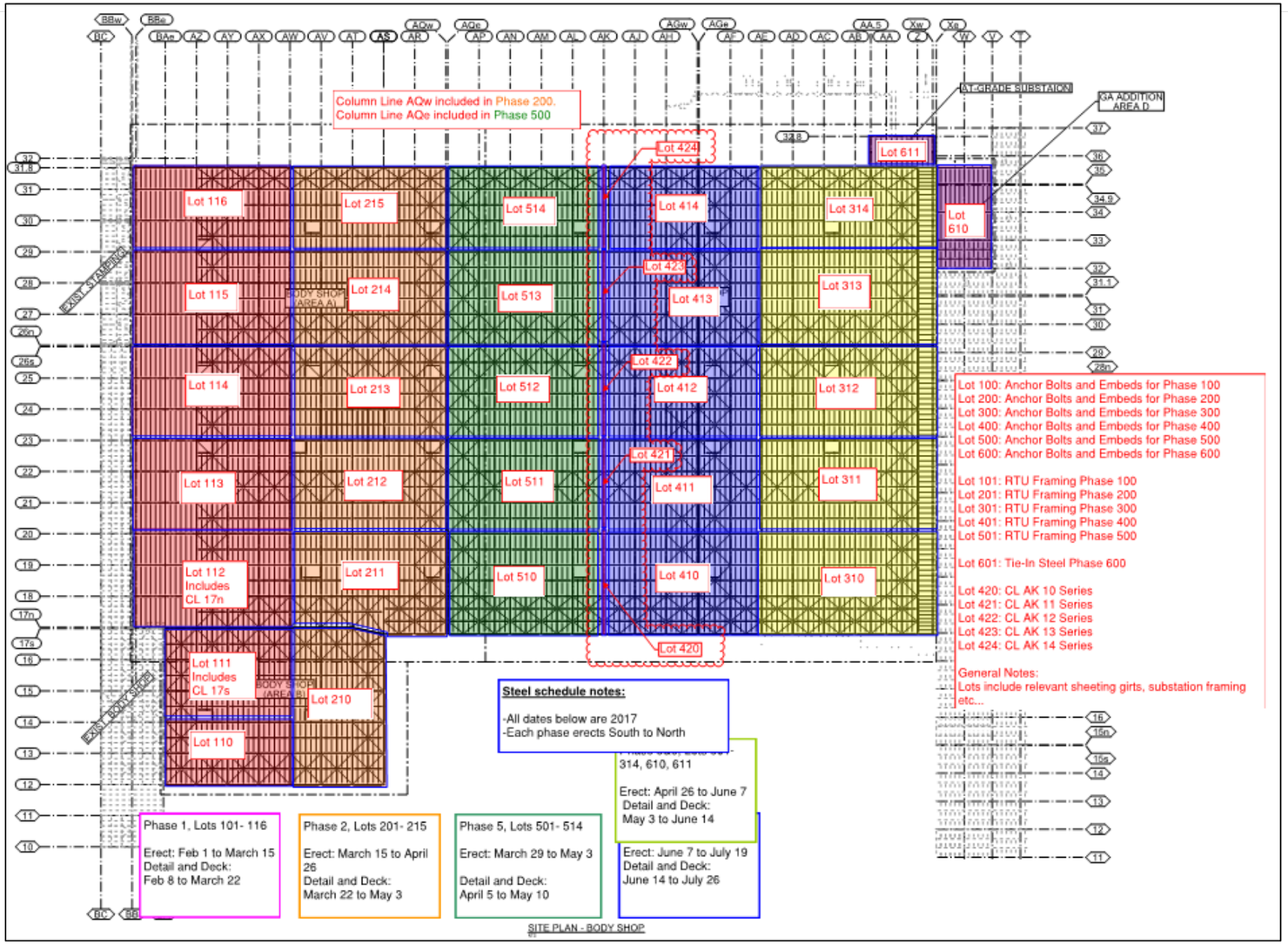
"Engineer's Viewpoint"



LeanSteel™ Delivery Method

Post Design Phase (Cont.):

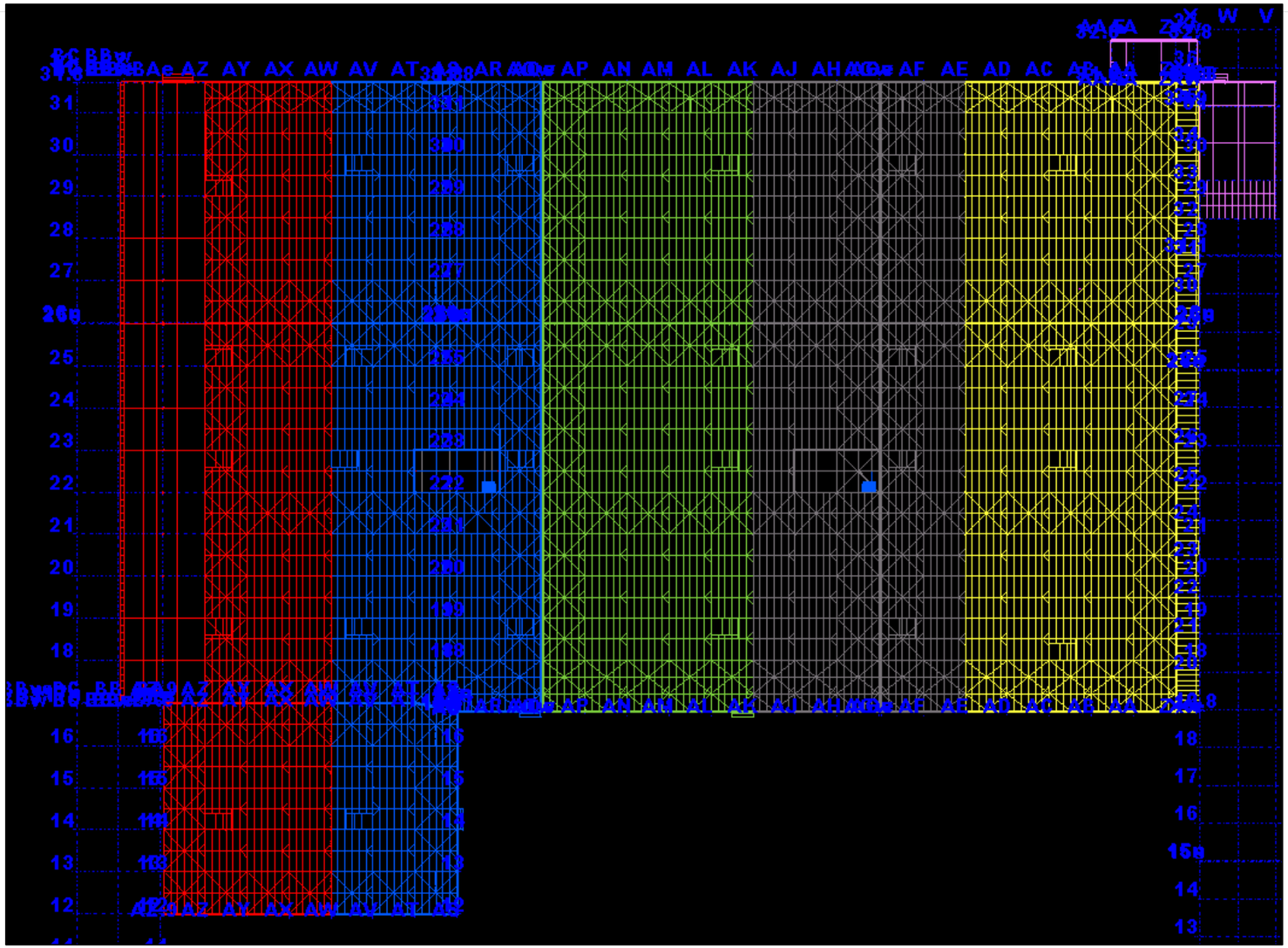
"CM/GC's Viewpoint"



LeanSteel™ Delivery Method

Post Design Phase (Cont.):

"LeanSteel™ Viewpoint"



LeanSteel™ Delivery Method

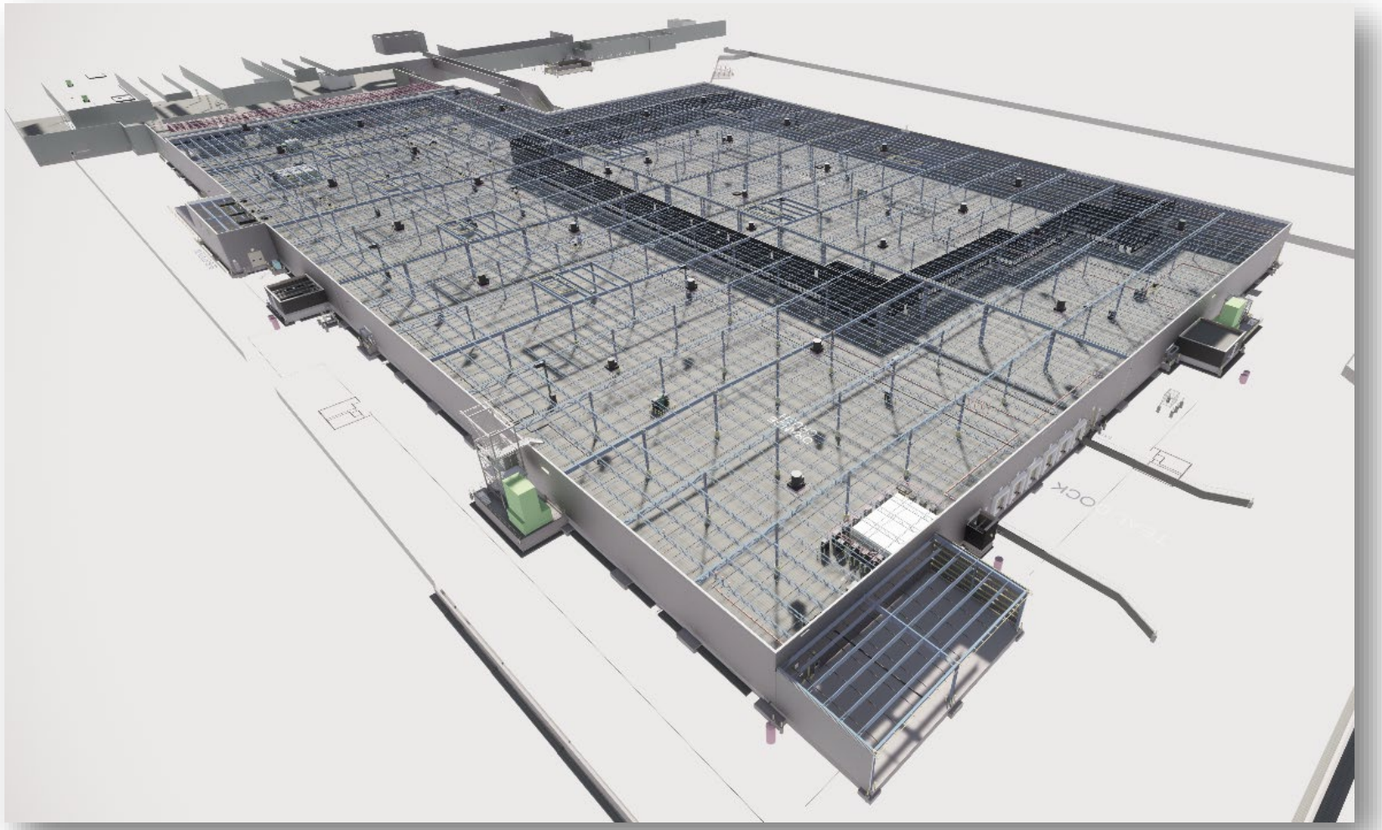
Post Design Phase (Cont.):

- Bid Assistance
  - Fully Detailed “Phase” of structural steel (for fabricator use)
    - Includes E-sheets, assembly drawings, part details, NC1 files, DXF files, Fabtrol Reports, KSS files
- Connection mapping and connection library
- Mill Order Report
- Color-coded IFC (Industry Foundation Classes) model for reference

LeanSteel™ Delivery Method

Post Design Phase (Cont.):

- Produces ‘Competitive Bids’
  - CD’s
  - Mill Order
  - Connection information
  - Fabrication “ready” model



LeanSteel™ Delivery Method

- Advantages During Construction Phase:
  - RFI and approval process is internal
  - Design revisions resolved immediately
  - Material is ordered/changes are “trackable”
  - Detailer and connection designer are fully engaged
  - Schedule savings: 12-16 weeks on average

LeanSteel™ Delivery Method

- Fees are offset:
  - GC’s structural steel fabricator does not need to include connection design/detailing in their fee
  - Lower general conditions and construction administration fees
  - Better cost certainty in steel bids
  - Potential savings on structural steel
  - Owner gets earlier occupancy

How can you apply this tomorrow?

- *If You Are An Owner…*
  - Challenge your construction manager or general contractor.
  - Ask about efficiencies in steel design and delivery methods; how can your team expedite the construction schedule related to structural steel?
- *If You Are a Construction Manager or General Contractor…*
  - Consider combining the roles of Structural Engineer of Record, Connection Designer and Detailer under one entity.
  - Have conversations with your SEoR about lean processes related to steel design and delivery.

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In the spirit of continuous improvement, we would like to remind you to complete this session's survey in the Congress app! We look forward to receiving your feedback. Highest rated presenters will be recognized.

Contact Us

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Thank you for attending this presentation. Enjoy the rest of the 22nd Annual LCI Congress!