

23RD ANNUAL



23RD LCI CONGRESS
OCTOBER 19-22

Transdisciplinary Solution Finding for Accelerated Project Delivery

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LEARN BY DOING FROM THOSE WHO DO

October 20, 2021

Health precautions to keep everyone as safe as possible at Congress:

- Wear masks at all times in indoor events.
- Complete your daily health screening on your phone and bring it with you when you enter the center each day.
- Practice social distancing to the extent possible. Seating at plenary sessions is being structured to help with this.
- If you feel ill at any time, please leave the conference and return to your room/consult a physician as necessary.
- Ultimately, our collective health and safety at Congress is up to all of us. Thanks for your support!



Presenters



Scott Martin

Structural Engineer



Casey Olsen

Construction Manager



Sarah David

Enclosures Architect

The Challenge



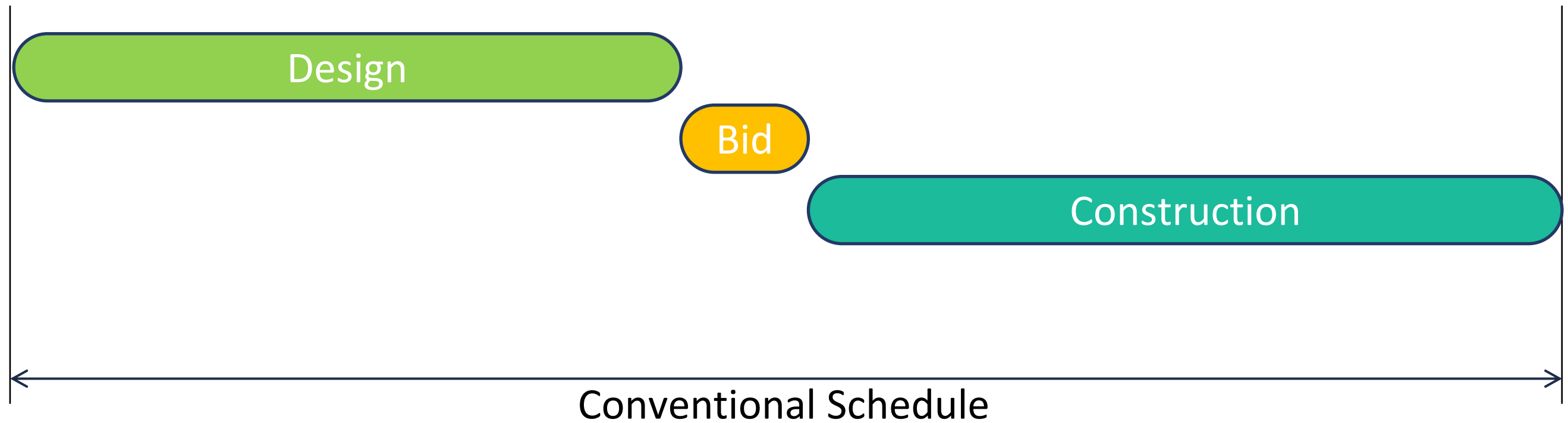
LEARN BY DOING FROM THOSE WHO DO



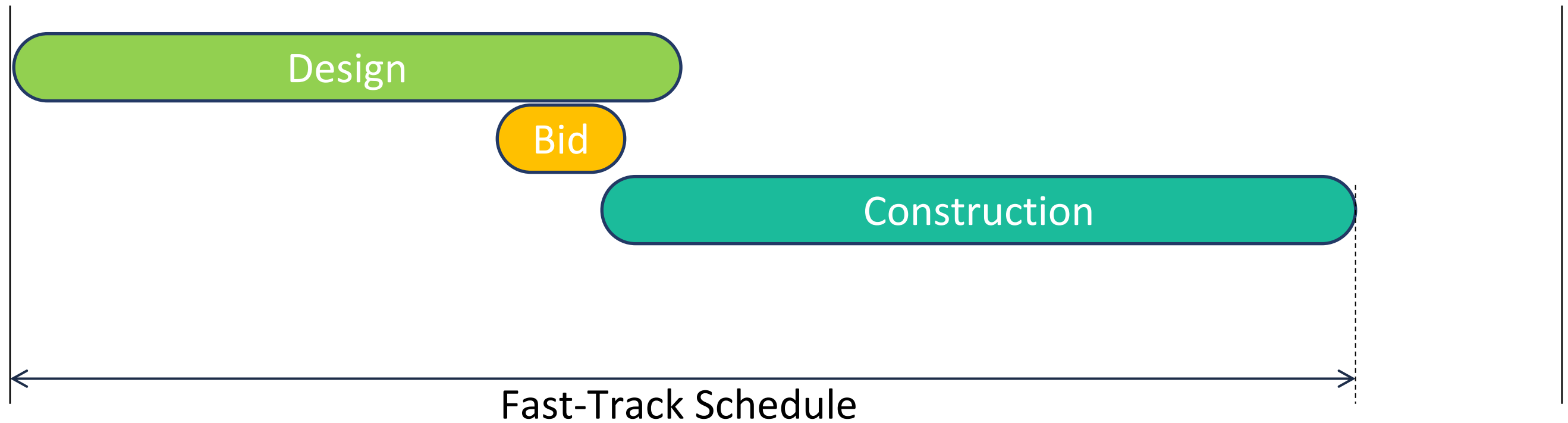
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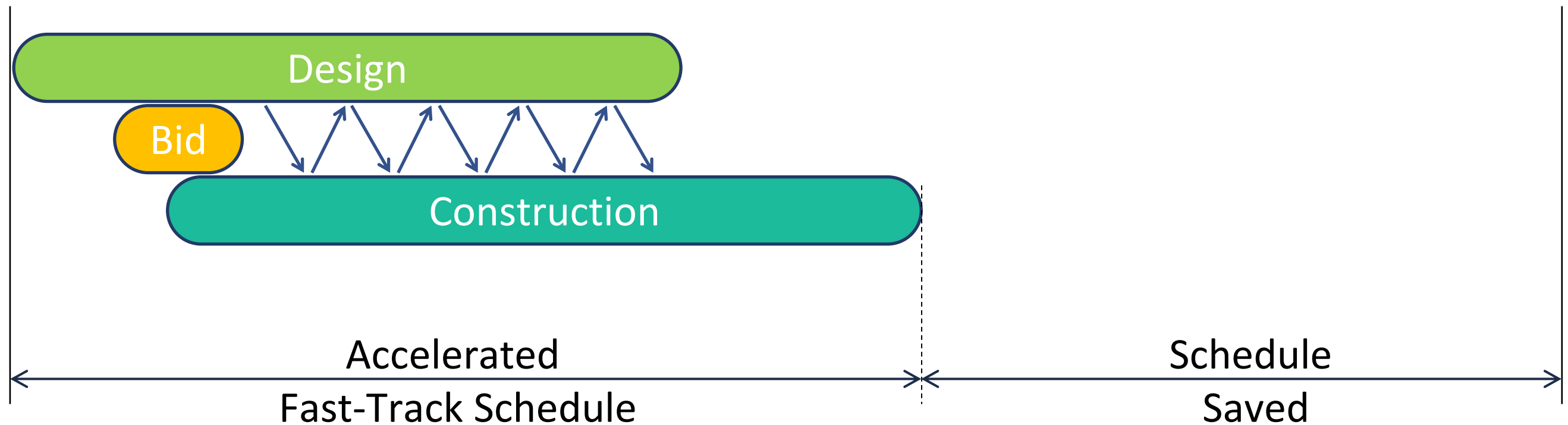
Speed to Market is Key



Speed to Market is Key



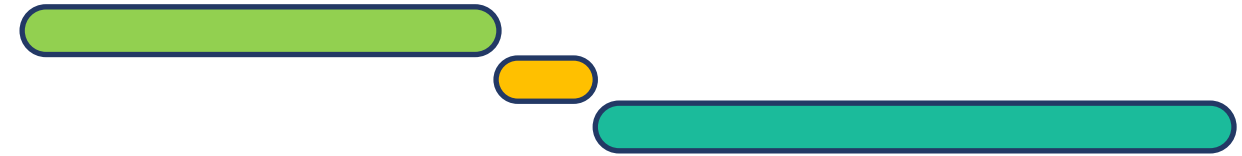
Speed to Market is Key



Fast-Track is not suited for all contract types

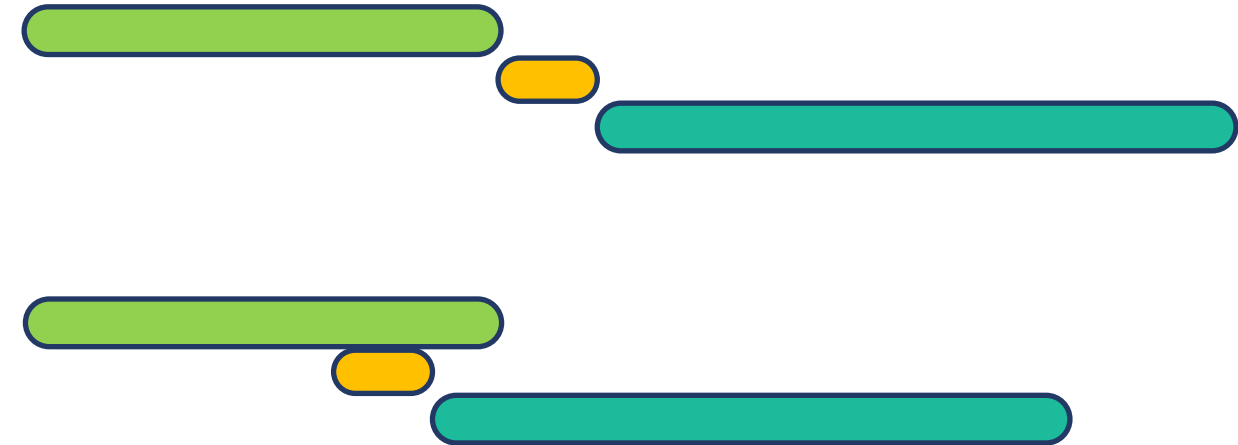
- Design-Bid-Build

- No builder input during design
- Design mostly done before construction start
- Long Schedule
- Early decision making?
 - Pros & Cons
- NOT Fast-Track



Fast-Track is not suited for all contract types

- CM-At-Risk
 - Some builder input during design
 - Design mostly done before construction start
 - Early decision making?
 - Pros & Cons
 - Limited Fast-Track



Fast-Track is not suited for all contract types

- IPD

- Team should all on board with communication, integration, and team buy-in

- Design-Build

- Design & build teams integrated under single entity
- Early decision making?
 - Pros & Cons
- Accelerated Fast-Track possible



Rising to the Challenge



Multidisciplinary Team



Multidisciplinary Team



Transdisciplinary vs. Multidisciplinary

Transdisciplinarity in health care involves **transcending of disciplinary boundaries**, a sharing of knowledge, skills and decision-making, a focus on real-world problems and the inclusion of multiple stakeholders including patients, their families and their communities.

A transdisciplinary team is one in which **members come together from the beginning to jointly communicate, exchange ideas and work together** to come up with solutions to problems.



Transdisciplinary vs. Multidisciplinary

Intent

To support high-performance, cost-effective project outcomes through an early analysis of the **interrelationships among systems**.

Requirements

Beginning in pre-design and continuing throughout the design phases, identify and use opportunities to **achieve synergies across disciplines and building systems** described below. Use the analyses to inform the owner's project requirements (OPR), basis of design (BOD), design documents, and construction documents.



Transdisciplinary vs. Multidisciplinary

Design-Build Project Delivery

The Owner manages only one contract with a single point of responsibility. The designer and contractor work together from the beginning, as a team, providing unified project recommendations to fit the Owner's schedule and budget. Any **changes are addressed by the entire team, leading to collaborative problem-solving and innovation**, not excuses or blame-shifting. While single-source contracting is the fundamental difference between design-build and the old ways, equally important is the culture of collaboration inherent in design-build.



Transdisciplinary vs. Multidisciplinary

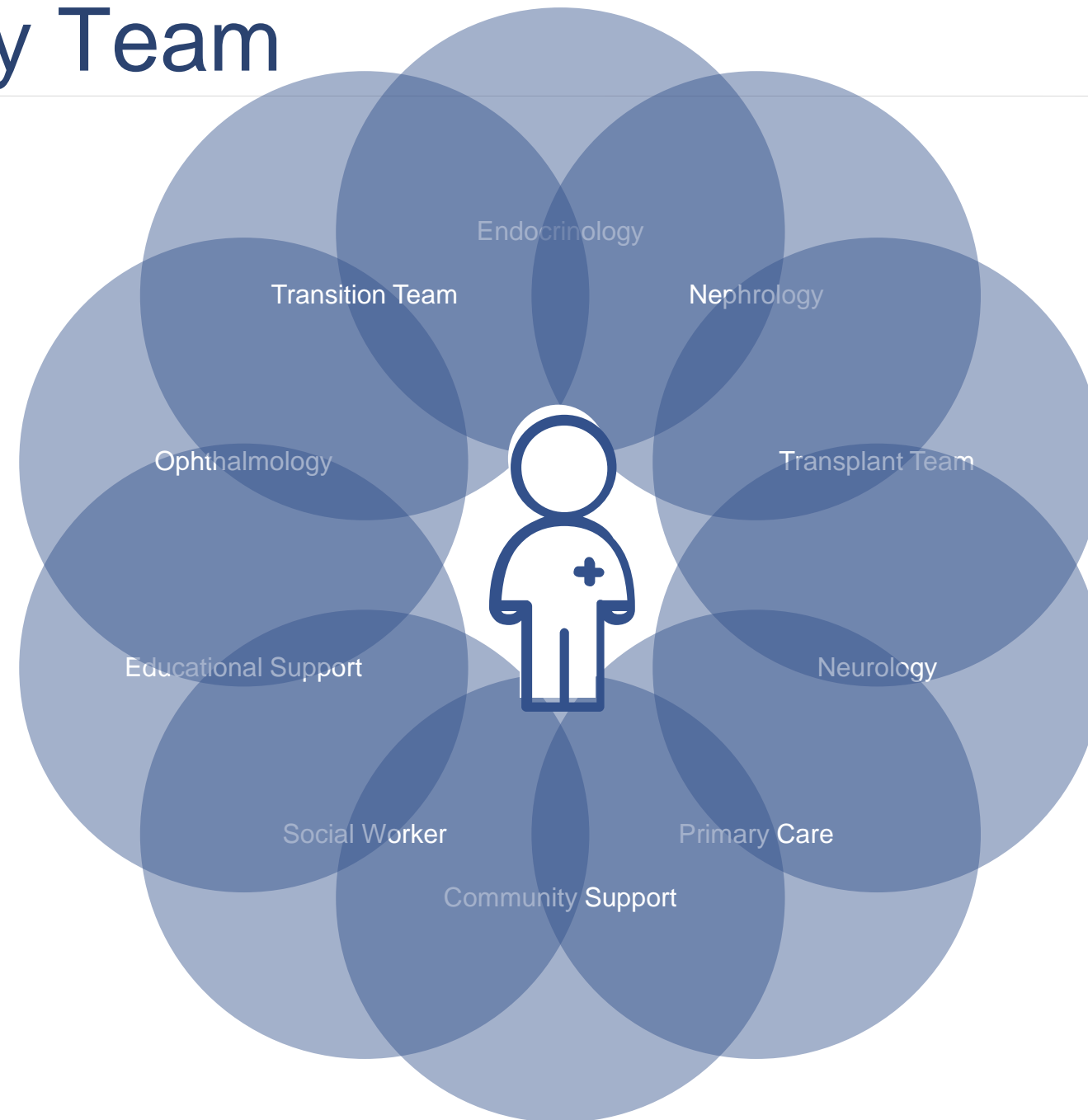
Construction industry studies have shown 50% or more of the effort required to deliver a built environment is non-value added effort, or waste in the eyes of the customer (CII, 2004).



People are at the center of Lean Construction. They **collaborate within and across teams** using foundational Lean principles with the goal of optimizing overall value



Transdisciplinary Team



Transdisciplinary Team



~~Transdisciplinary Team~~

^
MULTI



BIM

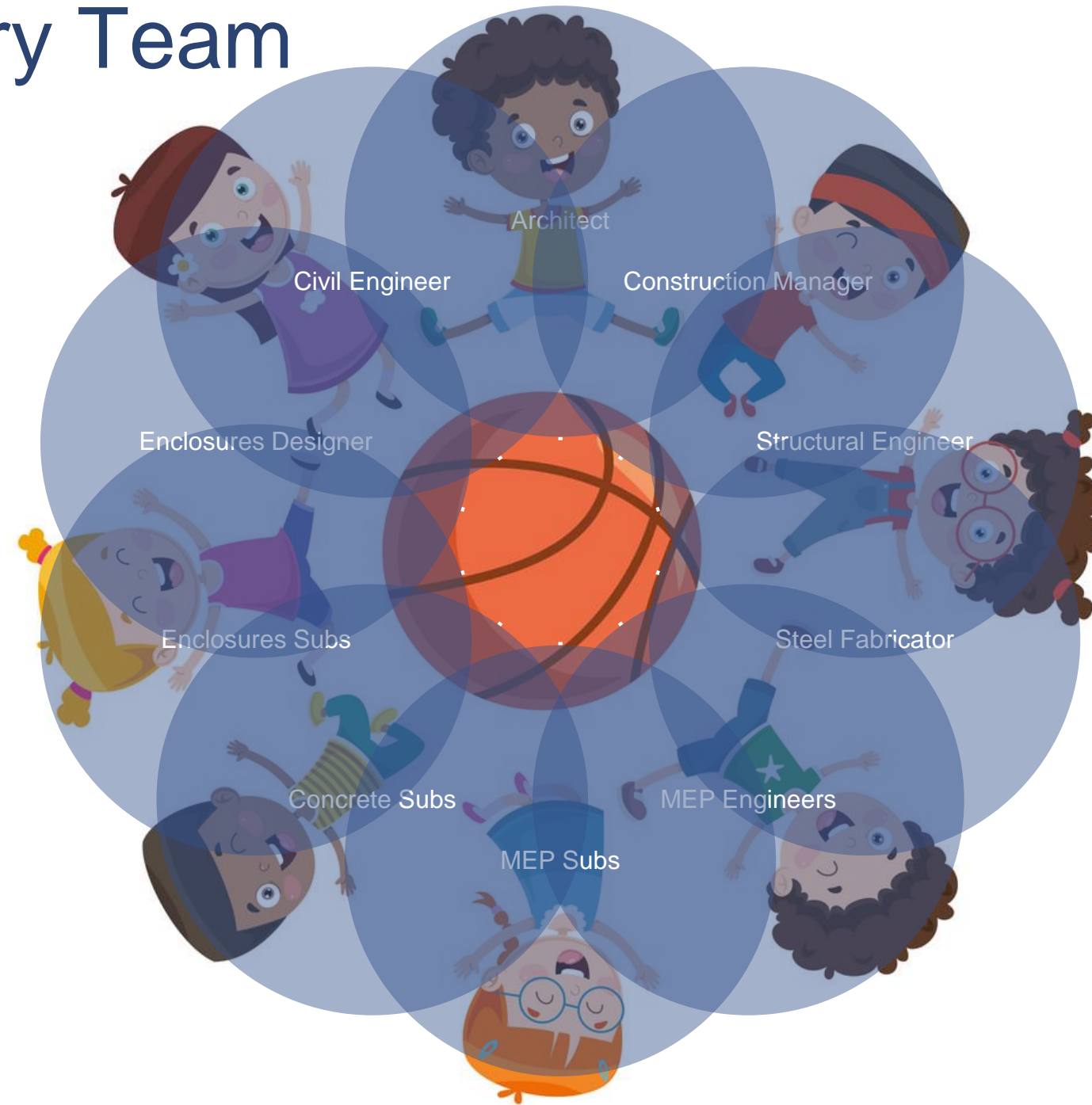
BUILDING

INFORMATION

MODELING

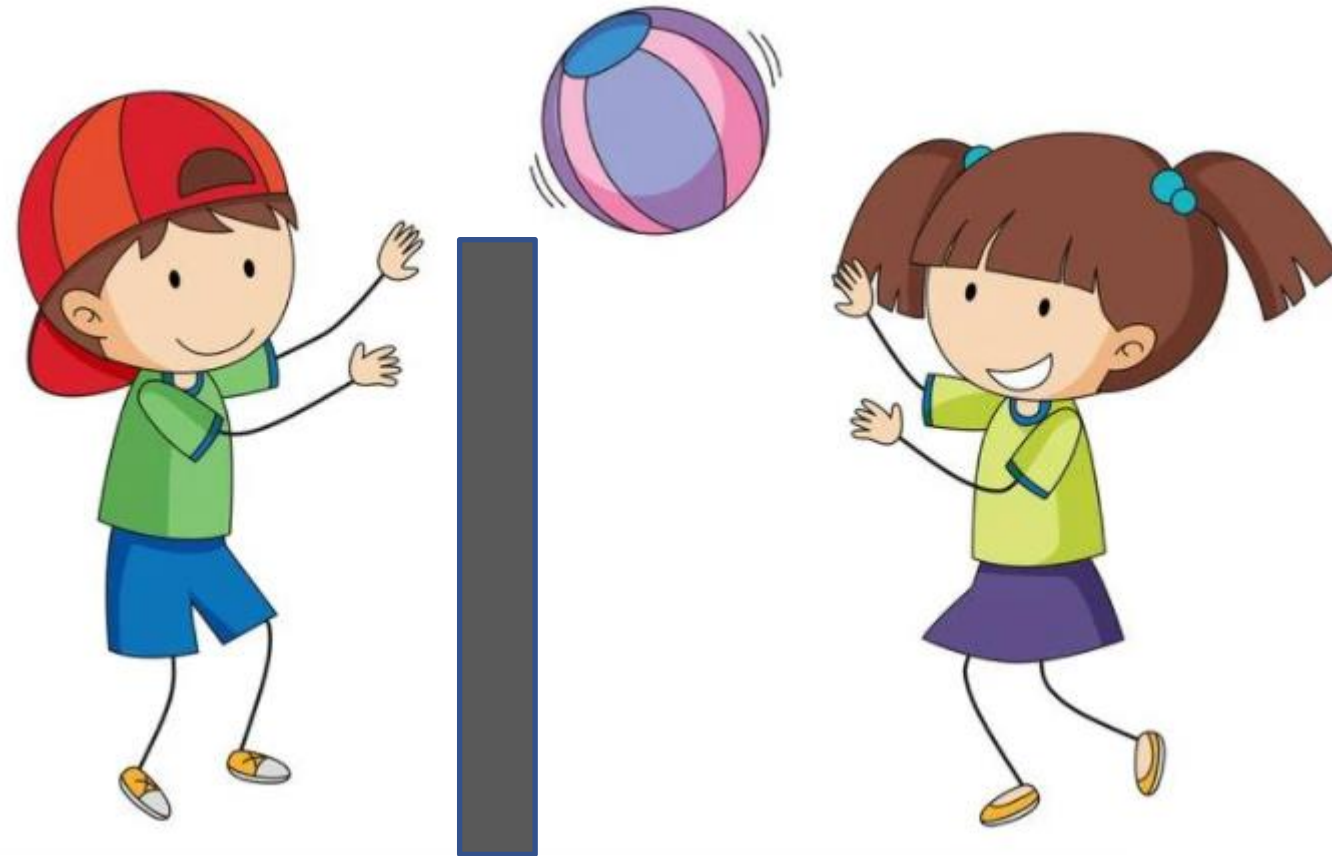
~~Transdisciplinary Team~~

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MULTI



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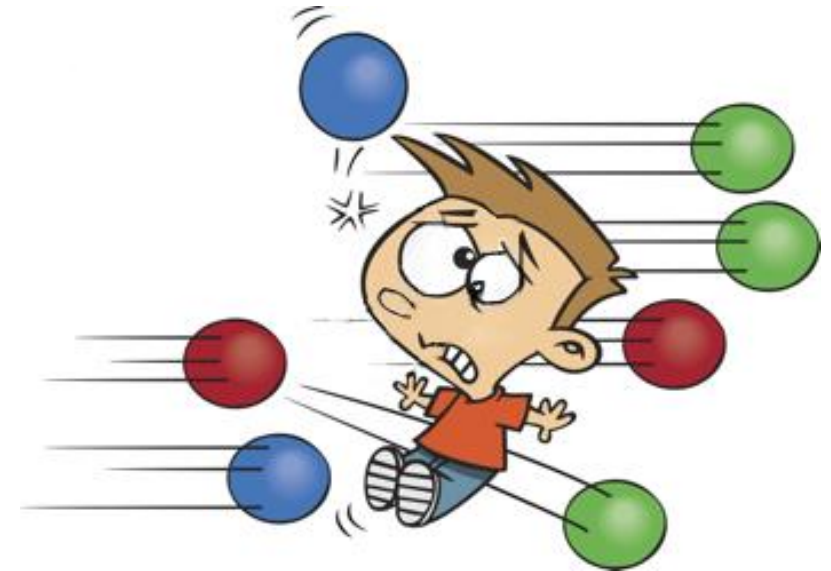
~~Transdisciplinary Team~~

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~~Transdisciplinary Team~~

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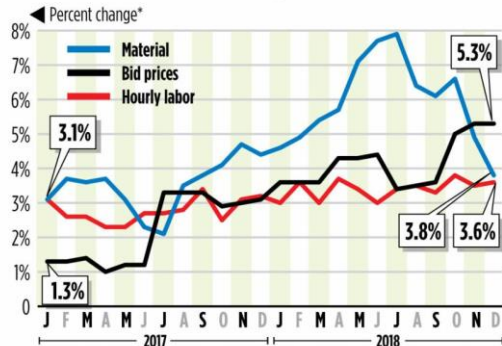


TRANSdisciplinary Team

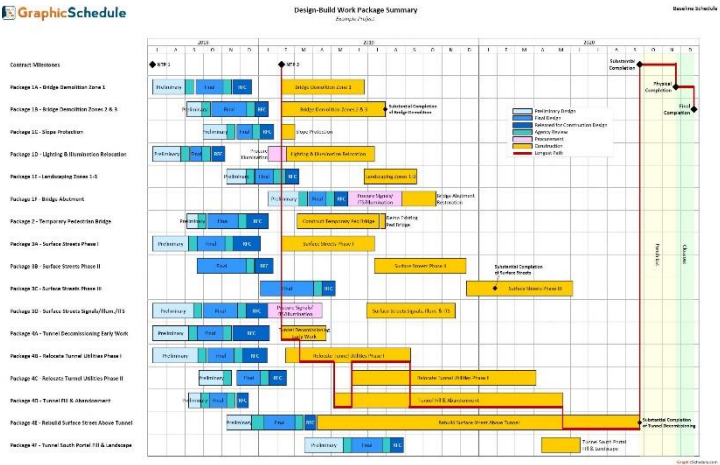
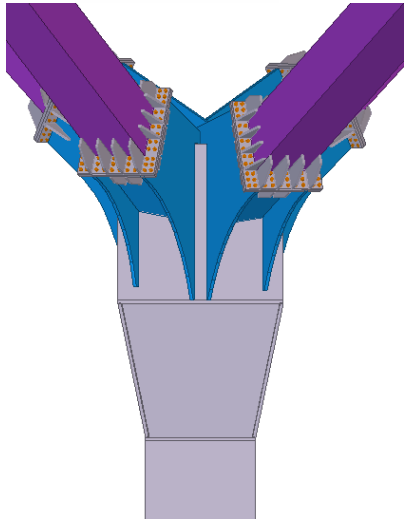


Construction costs

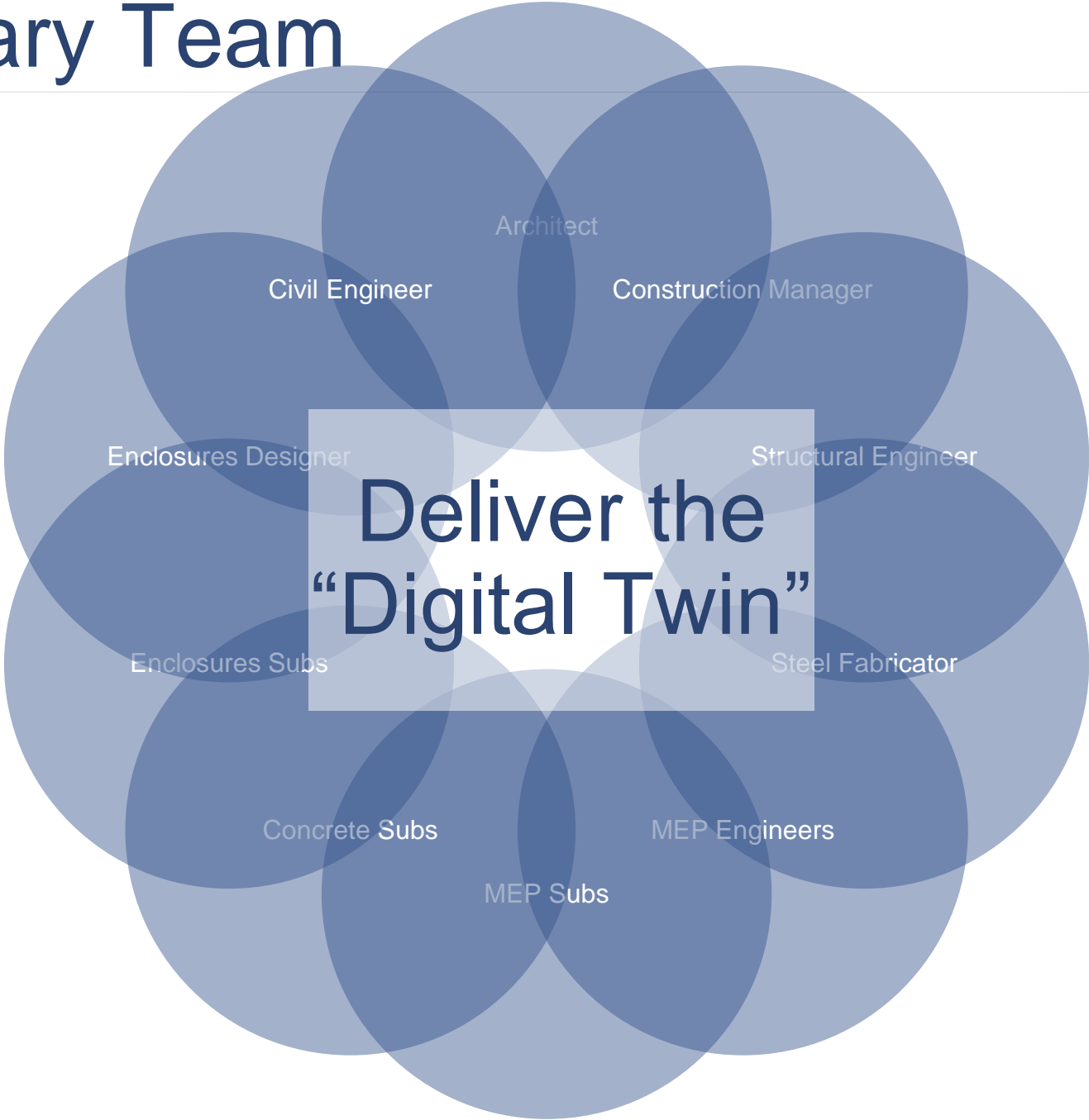
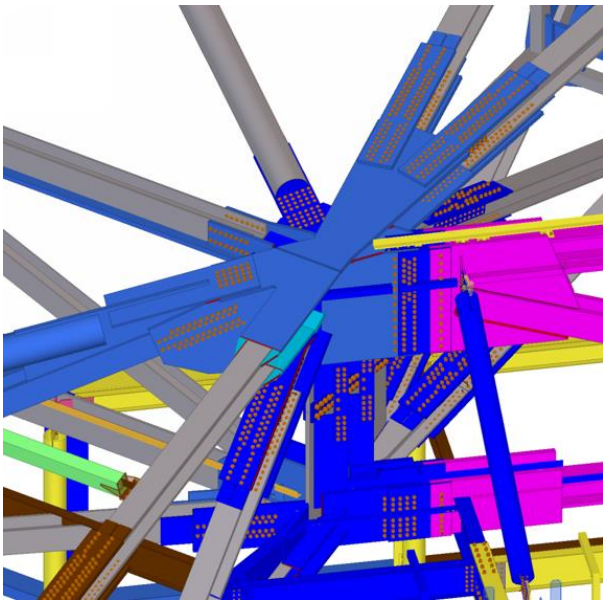
In the last two years, material and labor costs have grown faster than contractors' bids for work. That means contractors had thinner profit margins or found more efficient ways to get work done. In the last few months of 2018, bid prices started to rise.



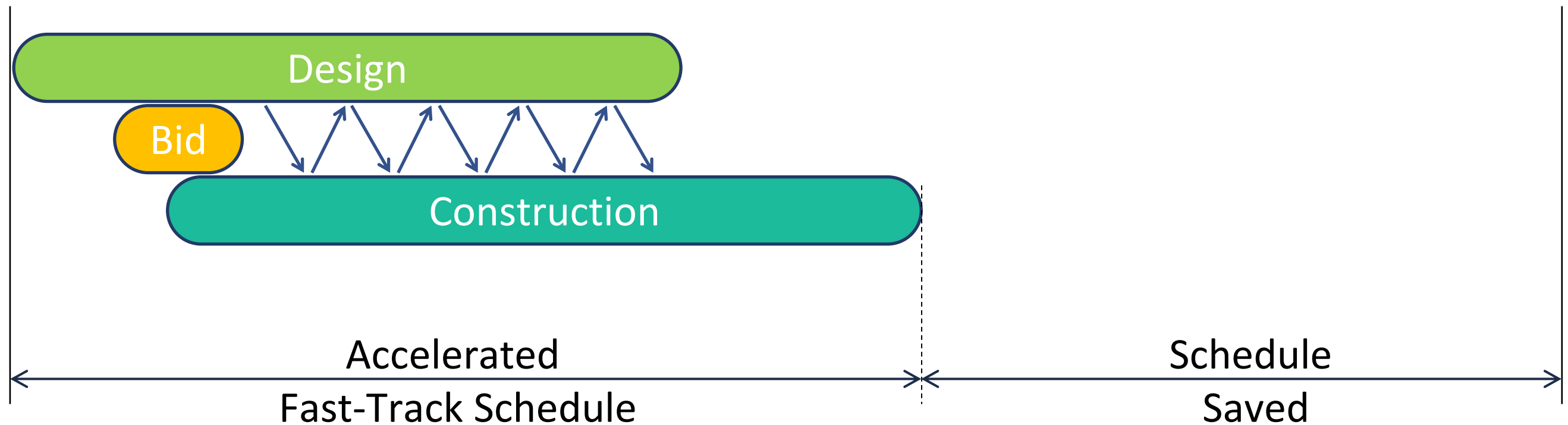
*Increases are calculated by comparing monthly spending with the same month a year ago. Hourly wages do not include overtime.
SOURCE: Associated General Contractors, Bureau of Labor Statistics and Producer Price Index
STAFF GRAPHIC | MICHAEL FISHER



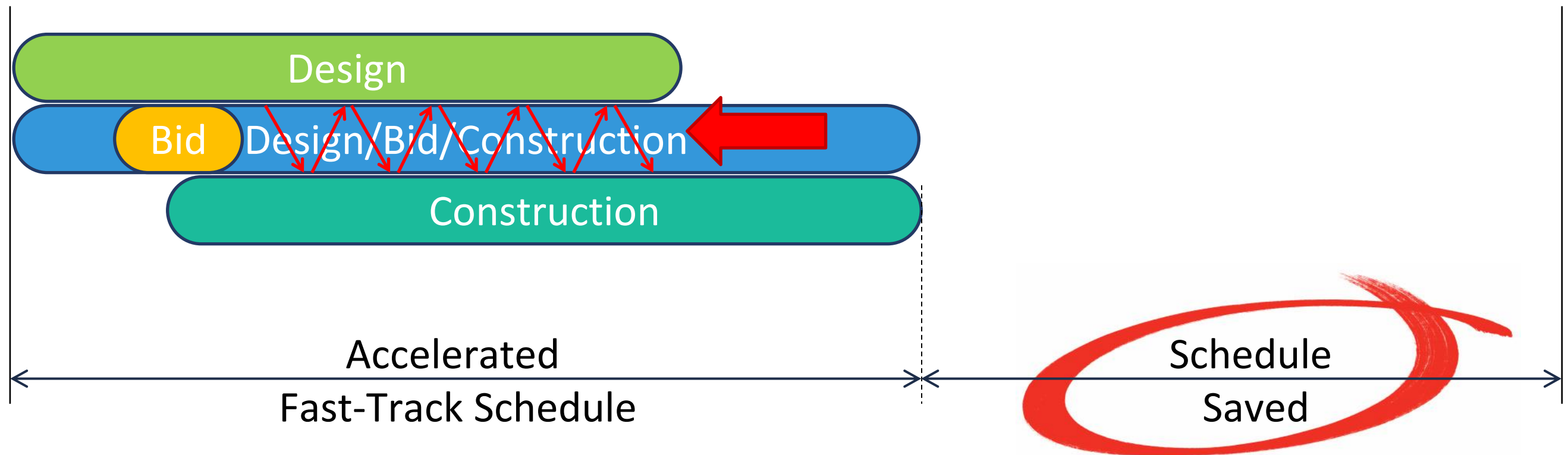
TRANSdisciplinary Team



Deliver the “Digital Twin”



Deliver the “Digital Twin”



Focus on Roles & Responsibilities



Team Structure

- Know your primary **ROLE**
- Hold each other **ACCOUNTABLE**

Key Decision Makers

- *Internal Team AND External Stakeholders*
- **EMPOWERED** to make decisions
- Setup conflict **RESOLUTION** structure
- Stay **INVOLVED** in the process

Focus on Roles & Responsibilities

- Benefits of focused system groups for decision making
 - Need to empower **multiple decision makers** – top people can't be everywhere
 - Need enhanced coordination between those decision makers
 - PIT, SSPMT, Alliances
 - **Regularly scheduled meetings** / touch points may be tiring, but necessary to assure alignment
 - Assures decision makers will be there



Characteristics of a highly functional team

- Create Accountability
- Flexible and collaborative
- Good chemistry & respect for each other
- Alignment towards common goals
- Trust
- Transparency
- Replace individual egos with team project



Fixing the problem

- Focus on the first 1/3 of Critical Path items that need to be coordinated first
 - Overall architecture (not the details)
 - Structural frame
 - Enclosure & interfaces to frame
 - Foundations and subgrade items that could impact
 - Major MEP decisions
 - Power into the building
 - Major equipment weights / locations
 - Major duct chases



Items Critical to Success

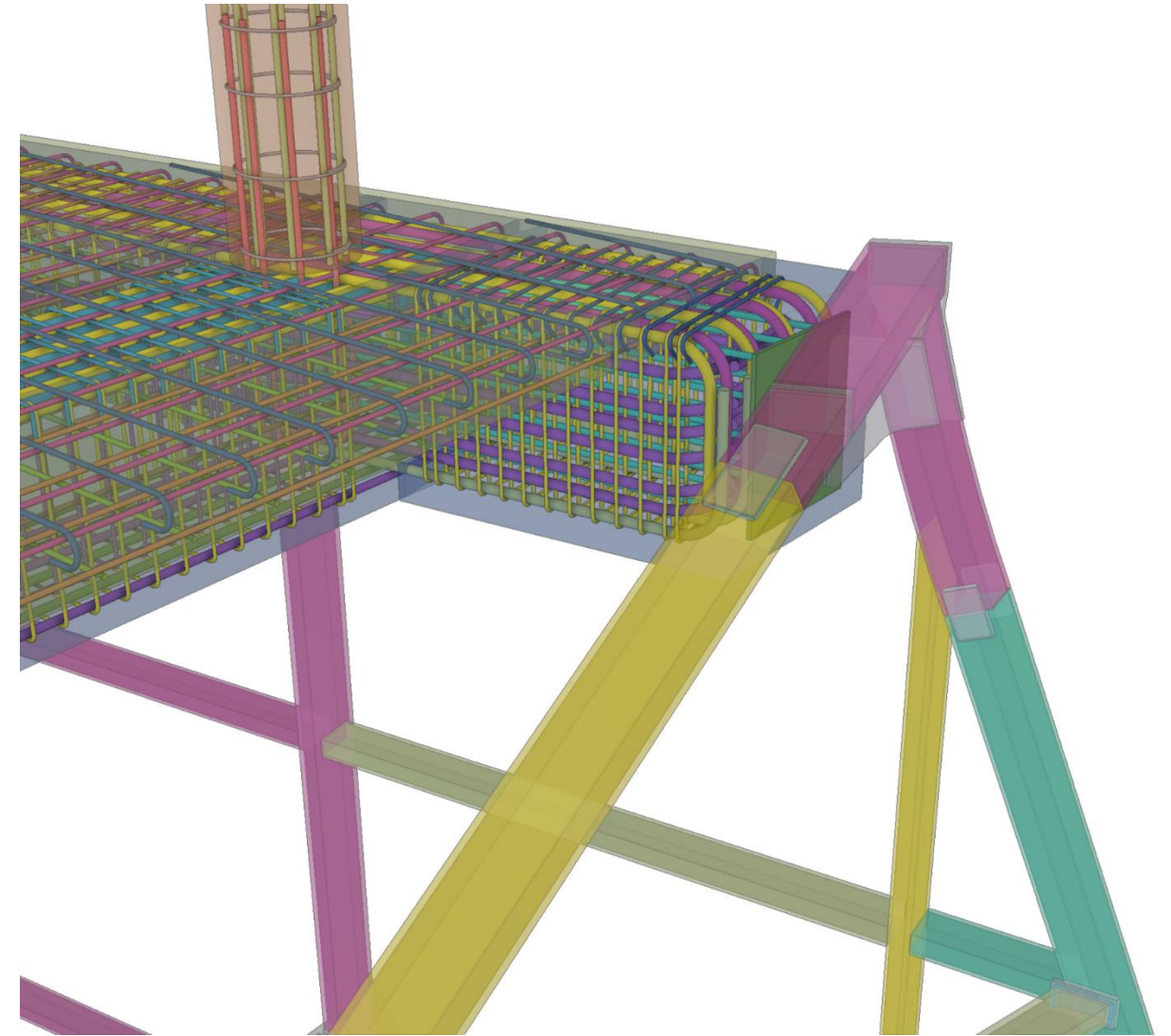
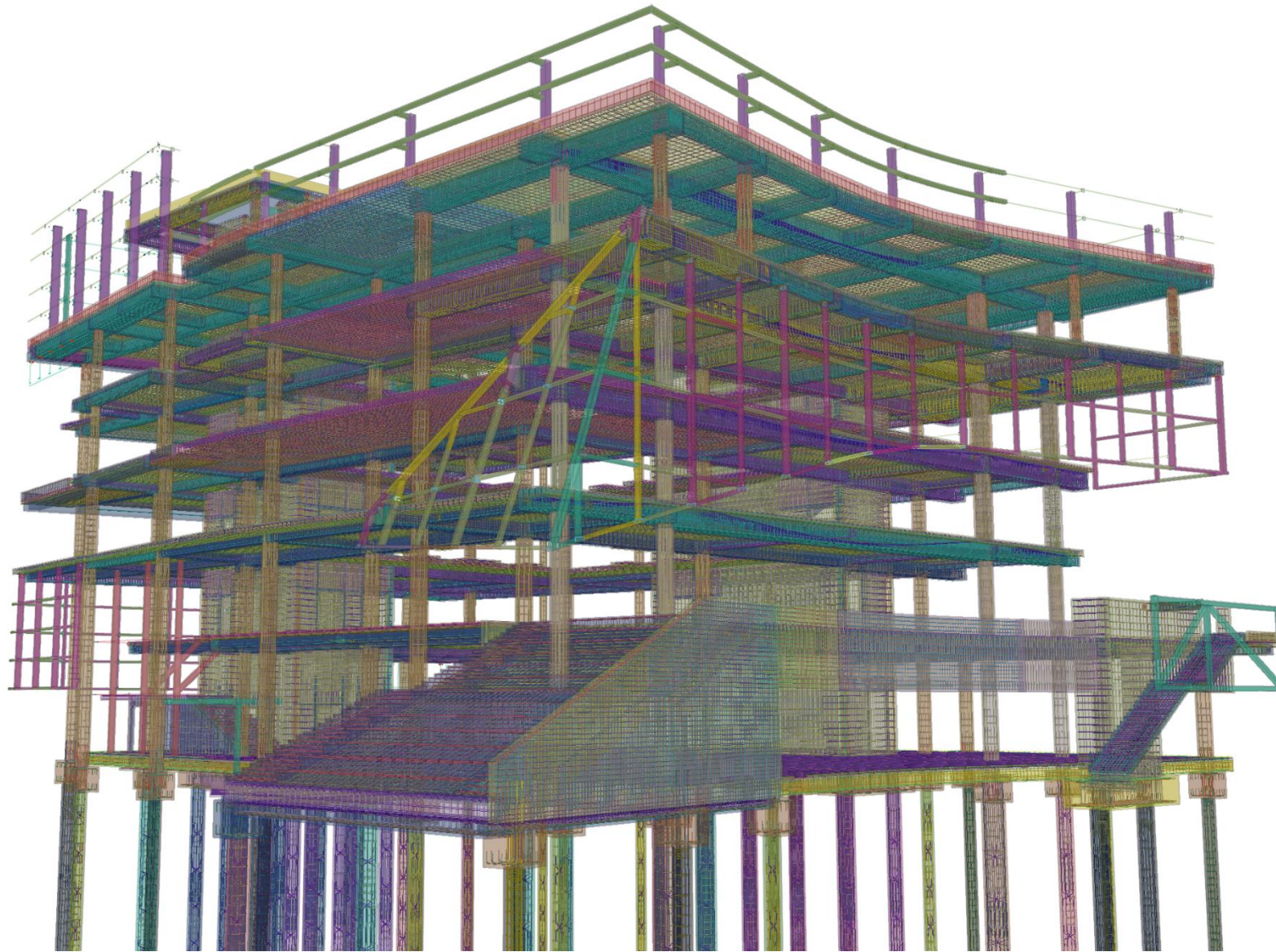


Critical Items – to the Structural Engineer

- Getting input early
- Having early decisions stuck to
- Figuring out constructability issues
 - Connection Designs & Coordination
 - Interface Congestion



Deliver the “digital twin”

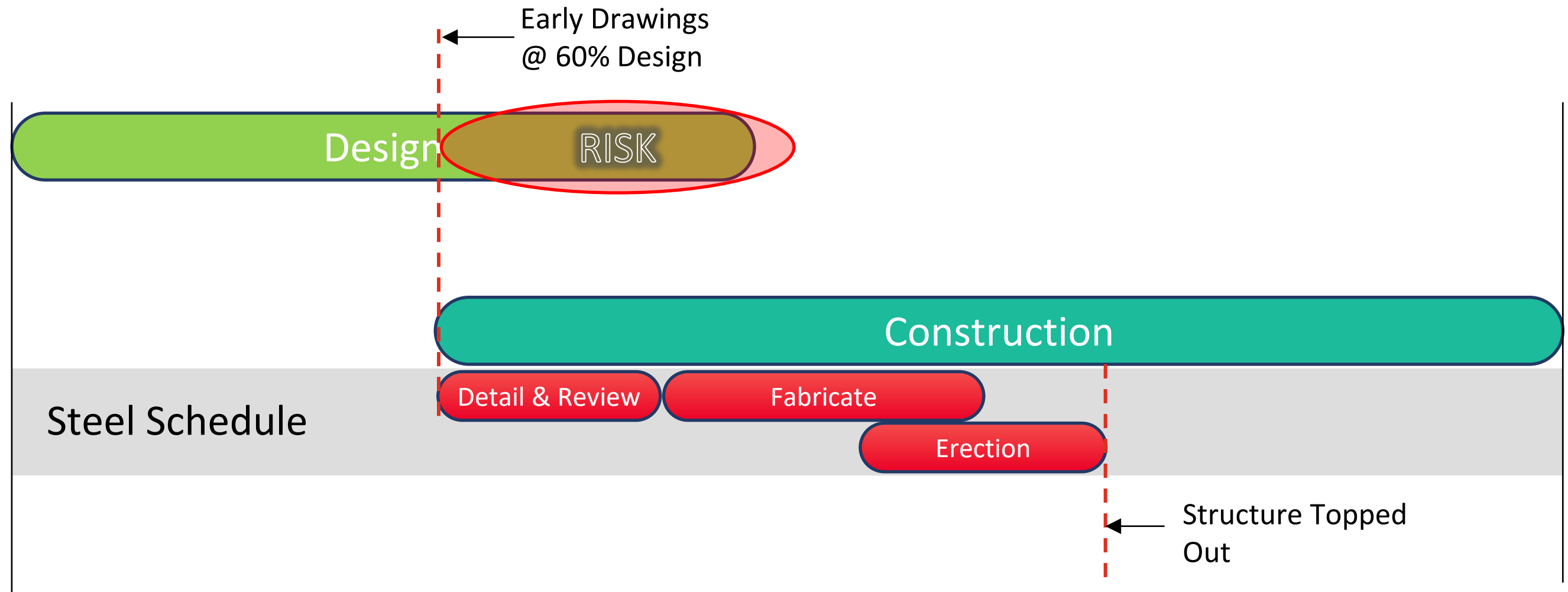


Critical Items – to the Structural Engineer

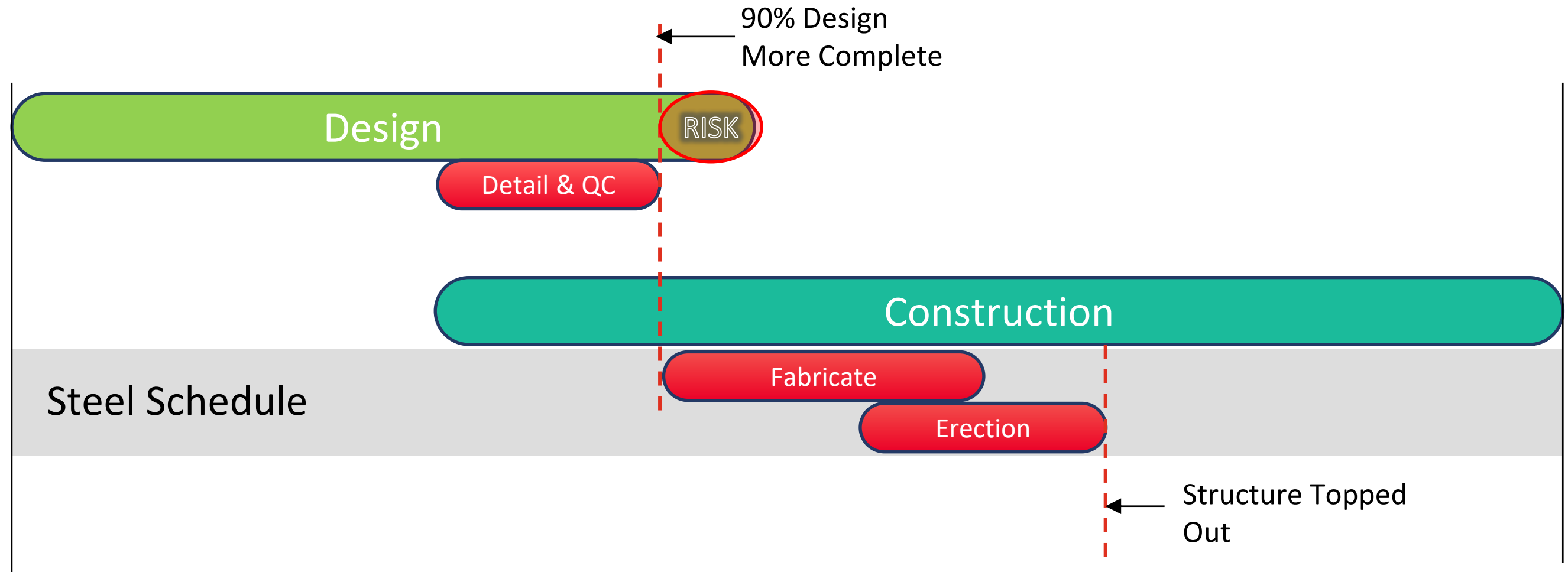
- Getting input early
- Having early decisions stuck to
- Figuring out constructability issues
 - Connection Designs & Coordination
 - Interface Congestion
- Deliver the “digital twin” as a fabrication level model to “buy” additional schedule time



Deliver the digital twin to “Buy” additional design time



Deliver the digital twin to “Buy” additional design time



Critical Items – Builder Perspective



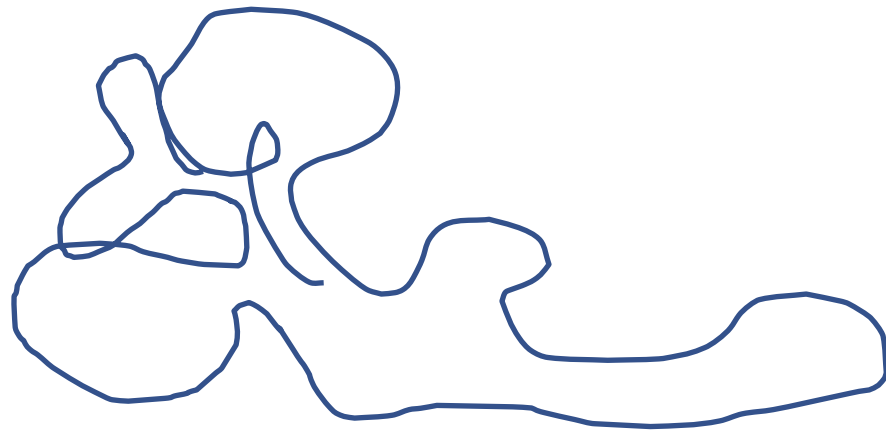
- Steel Size
 - No Jumbo Members
- Materials Locally Sourced
 - Avoid Customs
- Standard Equipment
 - Faster Submittals and Pretested
- Power Plan
 - How is it brought into the building?
- COVID Impacts
 - Supply chain is stressed

Critical Items – Architect Perspective



Critical Items – Architect Perspective

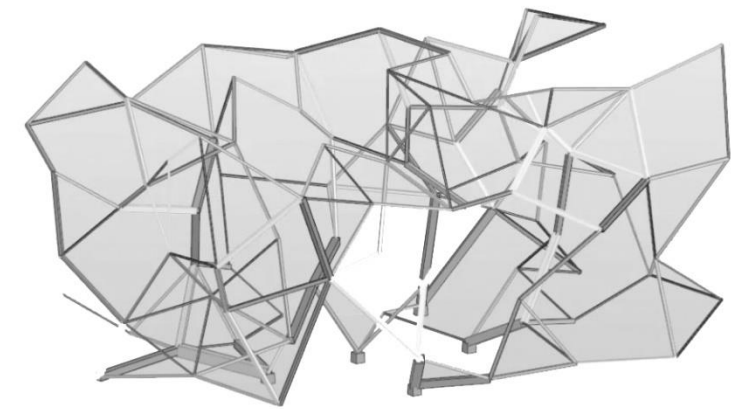
Intent?



NOT an option



But maybe this...

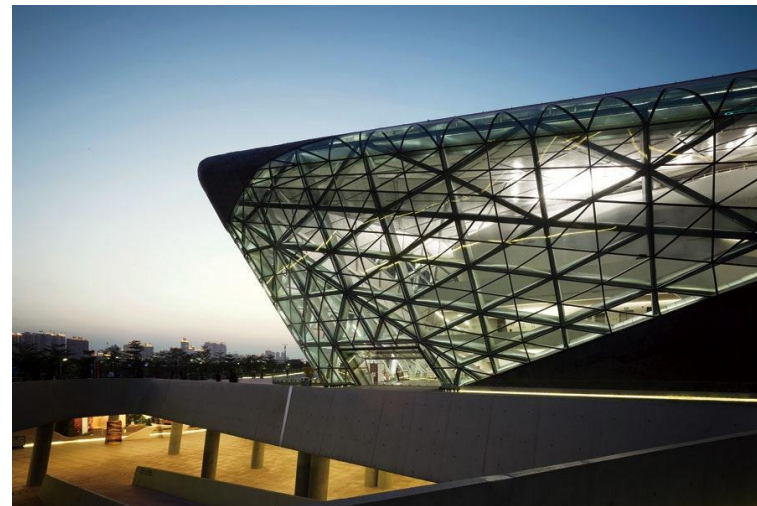


Critical Items – Architect Perspective

Or one of these that worked in the past....



*Amazon Spheres
NBBJ*



*Guangzhou Performance Center
Zaha Hadid Architects*

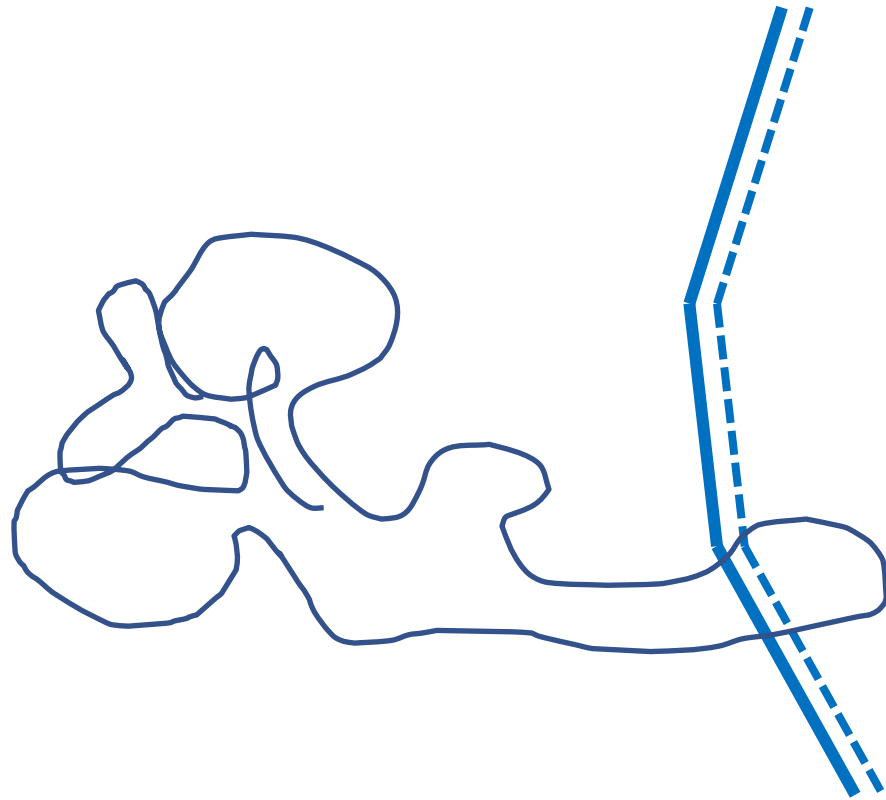


*Singapore Marina Bay
Wilkinson Eyre Architects
Grant Associates*

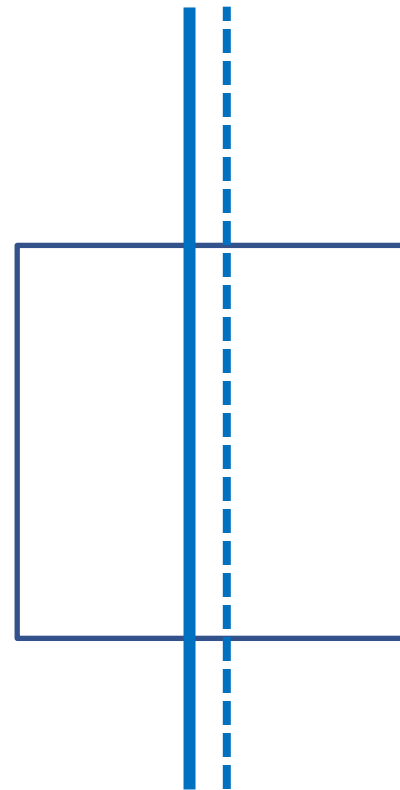


*Foundation Louis Vuitton
Gehry Partners*

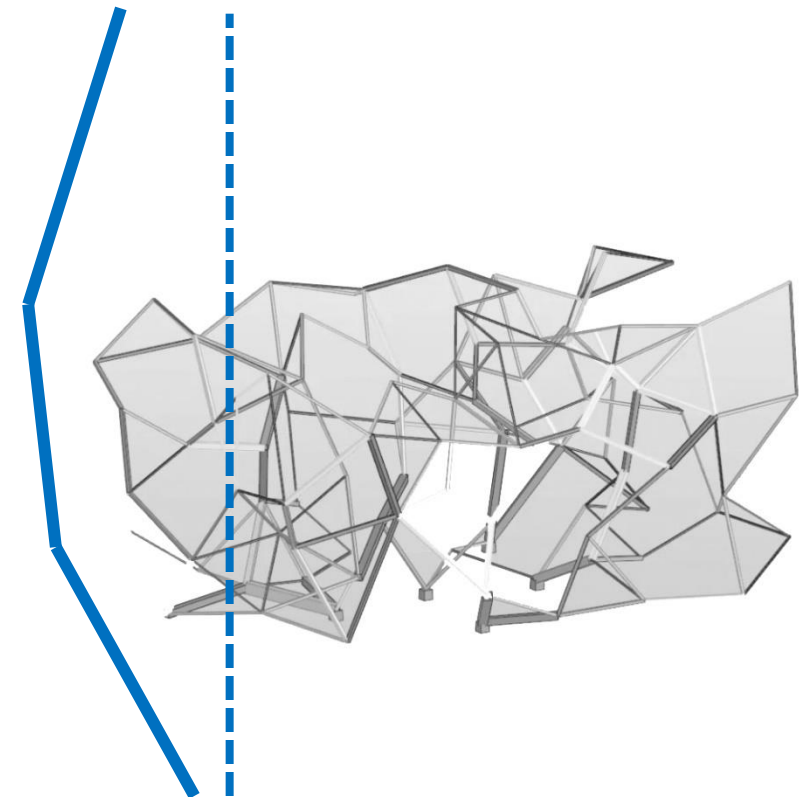
Critical Items – Architect Perspective



Design Intent



Contractor
Option



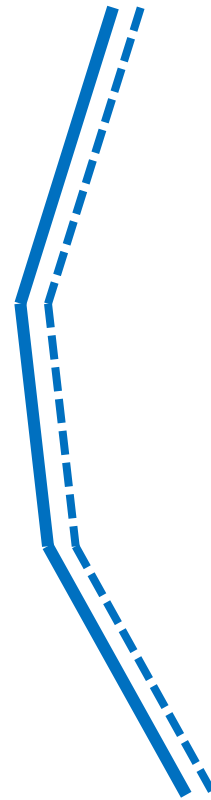
1st Proposal

Critical Items – Architect Perspective

Offset	1'-0"	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"
SF % Increase	0.4%	0.8%	1%	1.5%	2%	2 %	2.6%	3%	3.5%	4%



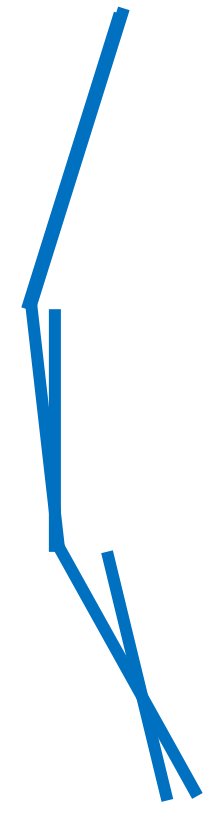
Critical Items – Architect Perspective



Design Intent

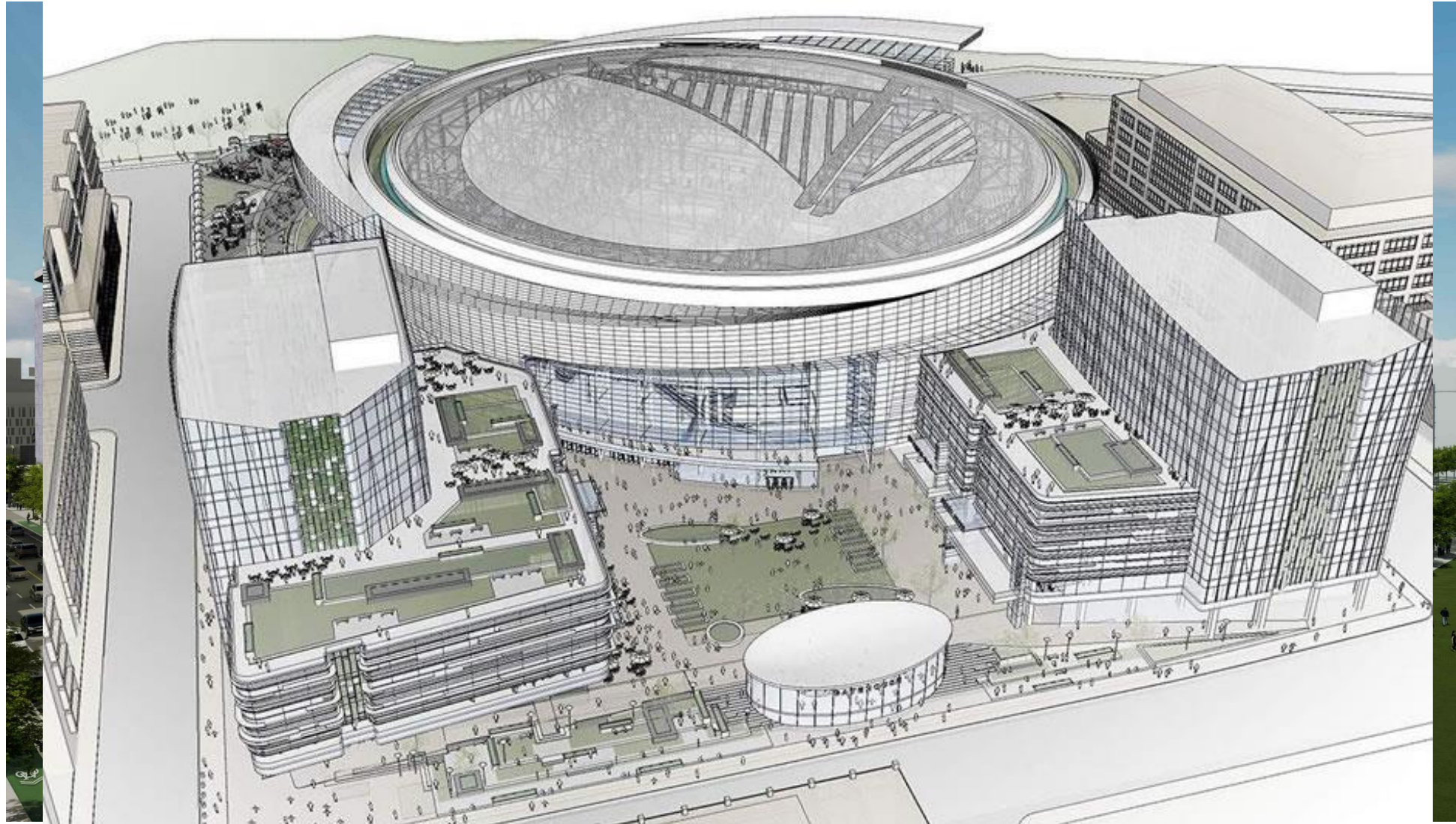


Contractor
Option



2nd Proposal

Critical Items – Architect Perspective



When it all breaks down



Examples of when this all broke down (warning signs)

- Things became siloed
 - Focused more on their part than the whole
- Isolated incidents when the wrong people (and wrong attitudes) were in the room
 - It's OK to acknowledge if you are that person!
- Decisions made without understanding consequences (unintentional)
- Early “locked” decisions were changed later by leadership / the owner
- Decisions not documented



How can you apply this tomorrow?

- As designers, if you need to adjust your scope to fit a low design fee, **have candid discussions with your client** about the risks of not figuring the design out “during design”
- Plan to **work in a transdisciplinary manner** with the team towards the common goal of a successful project
- After your team is assembled, reassess and **identify who the key decision makers are**. Is there anybody missing?
- Provide **multiple smart design options** up front for the team to consider – particularly as relates to risks and benefits of one choice over the other – include people who have walked those choice paths in the past and know where they’ll lead
- Be able to quickly **study design options digitally**– even if they’re only vignettes and not the entire project
- Make sure you’ve **set the critical path milestones early** with the team and revisit them weekly



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In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.

Contact Us

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Thank you for attending this presentation. Enjoy the rest of the 23rd Annual LCI Congress!