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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

AIA Approved Continuing Education

Course Description

This session brings together valuable insight from general contractors with experience delivering mass timber projects. Attendees will hear from a panel of industry professionals who will share lessons learned and discuss key decisions that can influence cost-efficiency, constructability, and overall project outcomes. Topics will include the bid process, self-perform versus sub-contracting, scheduling and product delivery considerations, the importance of efficient timber connections, moisture management, and more. Participants will gain a clearer understanding of how contractor perspectives can help design teams better anticipate construction considerations and contribute to more successful mass timber projects.

Learning Objectives

1. Learn from industry experts about the critical decisions and strategies that can impact the cost-efficiency and success of mass timber projects.

2. Review strategies to effectively implement best practices in costing and project delivery for mass timber projects, improving overall project outcomes.

3. Review process for bidding and scheduling mass timber projects compared to other project types.

4. Understand different product delivery methods for mass timber construction and how the potential risk for weather-related impacts compare to cost benefits and schedule.

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DPR CONSTRUCTION

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SWINERTON

- Established in 1888
- 100% Employee-Owned
- 4,300+ Construction Experts
- 24 Offices from Coast-to-Coast

ENR Engineering News-Record

2025 RANKINGS

#1 CA Top Contractor since 2014

#2 Education

#3 Government/Public Buildings

#5 Green Contractor

ECOSYSTEM

SWINERTON BUILDERS

Swinerton Builders provides a wide range of construction services: from general contracting and construction management to self-perform trade capabilities.

TIMBERLAB

Timberlab is a leader in holistic mass timber systems, including design assistance, material procurement, manufacturing, fabrication, and installation.

SWINERTON ENERGY

Swinerton Energy is an industrial energy partner offering engineering, procurement, construction, and design-build services.

SAKBuilders

SAK provides premier concrete services, including small-scale finishing to turnkey cast-in-place structures.

NBS NATIONAL BUILDING SPECIALTIES

NBS streamlines procurement with comprehensive furnish and install packages for building specialties included in CSI Divisions 10, 11, and 12.

SWINERTON MANAGEMENT & CONSULTING

SMC delivers expertise in consulting and management services for large-scale development and capital improvement projects.

GRIFFIN SWINERTON

Griffin Swinerton specializes in Public-Private Partnerships (P3), focused on the development, financing, construction, and management of public facilities.

LINDGREN

Lindgren is a real estate development investment partner, offering capital, balance sheet support, and transaction expertise.

SWINERTON × TIMBERLAB

Innovating for Over 137 Years

2016	2018	2020	2022	2024	2026	2028

Swinerton | Swinerton Mass Timber | Timberlab

- Hillsboro, OR
- Portland, OR
- Greenville, SC
- Swiss Home & Drain, OR
- Millersburg, OR

Vertical Integration + Domestically Sourced Materials = Cost Certainty

- Founded 1990
- Privately held, employee owned
- Specialize in technically challenging and sustainable projects
- National and targeted international experience
- +13,000 employees Nationwide

Advanced Technology

#4

DPR ranked No. 4 on Engineering News-Record magazine's Data Center list. (2025)

Healthcare

#2

DPR ranked No. 2 on Modern Healthcare magazine's Largest Contractors in the Healthcare industry list. (2025)

Higher Education

#3

DPR ranked No. 3 on Building Design + Construction magazine's university list. (2025)

Life Sciences

#1

DPR ranked No. 1 on Engineering News-Record magazine's pharmaceuticals list . (2025)

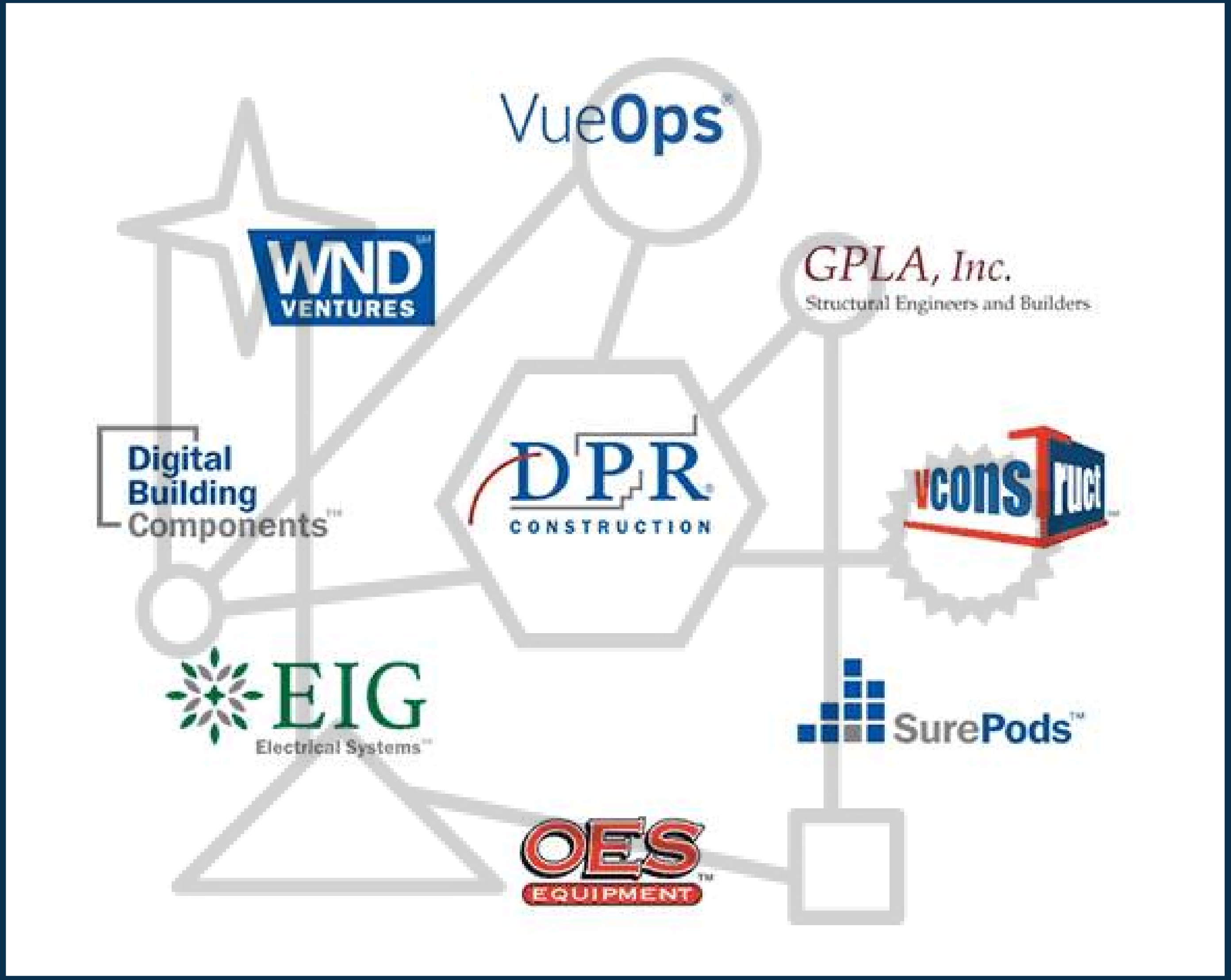
Commercial

#8

DPR ranked No. 8 on Engineering News-Record magazine's commercial office list. (2025)

Integrated Entities

The DPR Enterprise is a family of companies connecting a typically disjointed process from preconstruction through operations and maintenance. Our shared builder skillset and mindset allow us to approach prefabrication, software, and logistics not as tools or methods, but simply the way we build.



LEARNING
OBJECTIVES

1. Demonstrate how **Critical Decisions** affect project success

2. Share **Cost & Delivery** best practices

3. Clarify the **Processes** of bidding, buyout, self perform subcontracting and scheduling

4. Review **Delivery Methods** and weather moisture risk

The Tuckman Stage's of Mass Timber

2011 – 2015/2016

The industry establishes a common technical language: ANSI/APA PRG 320, product qualification, quality assurance, APA/third-party certification, and early IBC recognition of CLT.

Forming

2015/2016 – 2021/2022

The industry moves into code conflict, fire/life-safety debates, AHJ uncertainty, supply limitations, insurance concerns, and slow jurisdiction-by-jurisdiction adoption. The Type IV-A, IV-B, and IV-C code pathway comes forward.

Storming

2022 - 2025

The code path becomes more familiar. The 2021 and 2024 IBC provisions are adopted in more jurisdictions. Teams begin developing repeatable systems tailored to specific building types and markets, supported by tested assemblies, procurement strategies, prefabrication workflows, and carbon accountability.

Norming

2025 – present / emerging

Real data begins driving decisions: embodied carbon, schedule, prefabrication, Removed interior finishes, foundation savings, structural optimization, vibration, fire performance, cost-to-performance, and market fit. Mass timber expands into advanced technology, healthcare, lab/life science, data centers, and pharmaceutical manufacturing.

Performing

Future
Not an industry ending

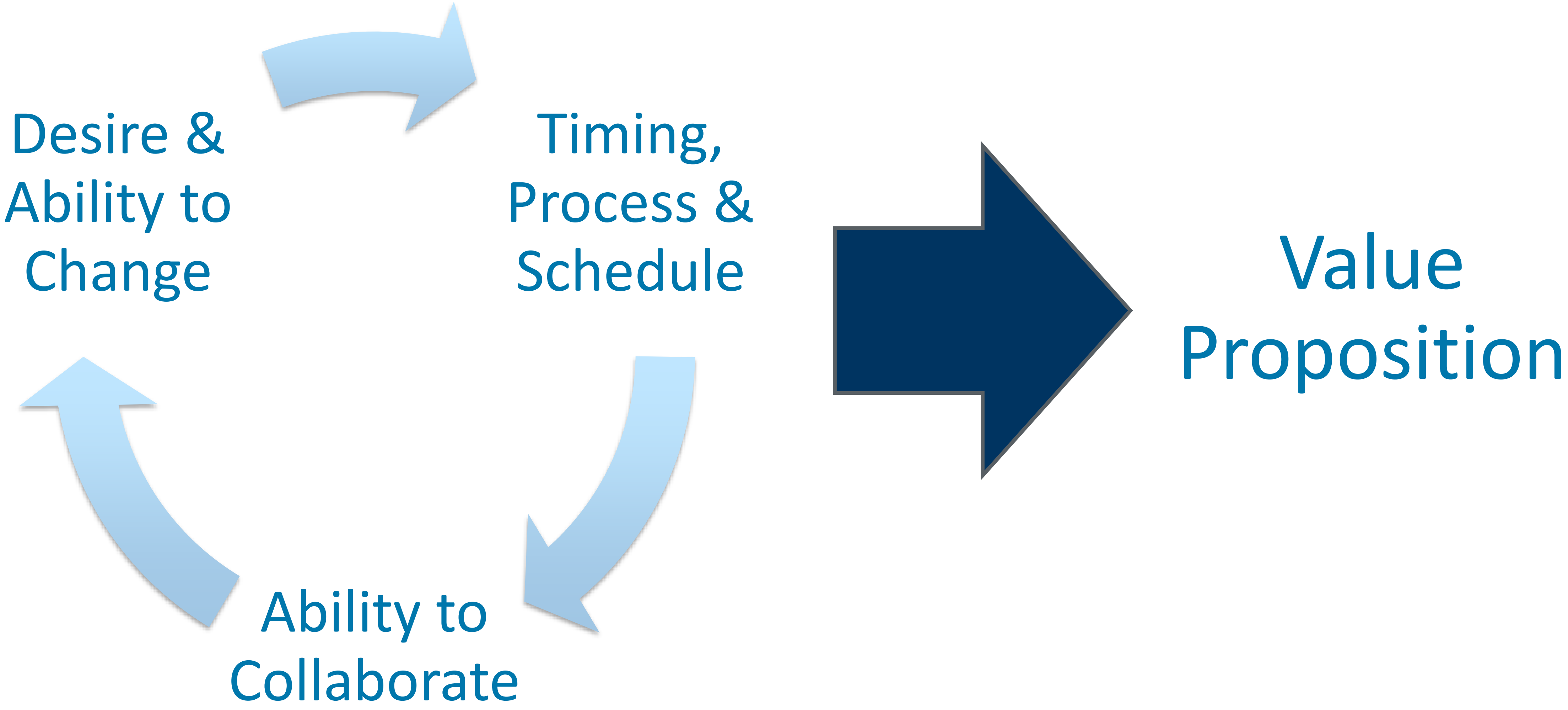
The "mass timber as novelty" chapter closes. Early pilot projects, first-of-their-kind approvals, and proof-of-concept.

Adjourning

CRITICAL DECISIONS

01

Factors for Evaluation



Steel

EXTREME DEMAND
Global steel demand is projected to grow ~30% by 2050, driven by infrastructure, manufacturing and urbanization.
— *World Steel Association*

LONG LEAD TIMES
Structural steel lead times have extended to 26–52 weeks or more for many projects, causing significant schedule risk.
— *Dodge Construction Network, 2023*

PRICING VOLATILITY
Steel prices have fluctuated >60% over the past 5 years, making accurate budgeting and long-term planning difficult.
— *Engineering News-Record, 2024*

DEPENDENT ON OFF-SHORE STEEL
The U.S. imports ~23% of the steel it uses. We rely heavily on foreign suppliers for a critical construction material.
— *American Iron and Steel Institute, 2023*

NONRENEWABLE RESOURCE
Steel is made from iron ore, a finite resource. Its production is energy-intensive and generates significant CO_2 emissions.
— *World Steel Association*

Mass Timber

RESPONDS TO GROWING DEMAND
Mass timber capacity in North America is expanding rapidly to meet demand with a sustainable, scalable domestic solution.

FASTER TO DELIVER
Mass timber components are prefabricated offsite for predictable production and shorter lead times—helping keep projects on schedule.

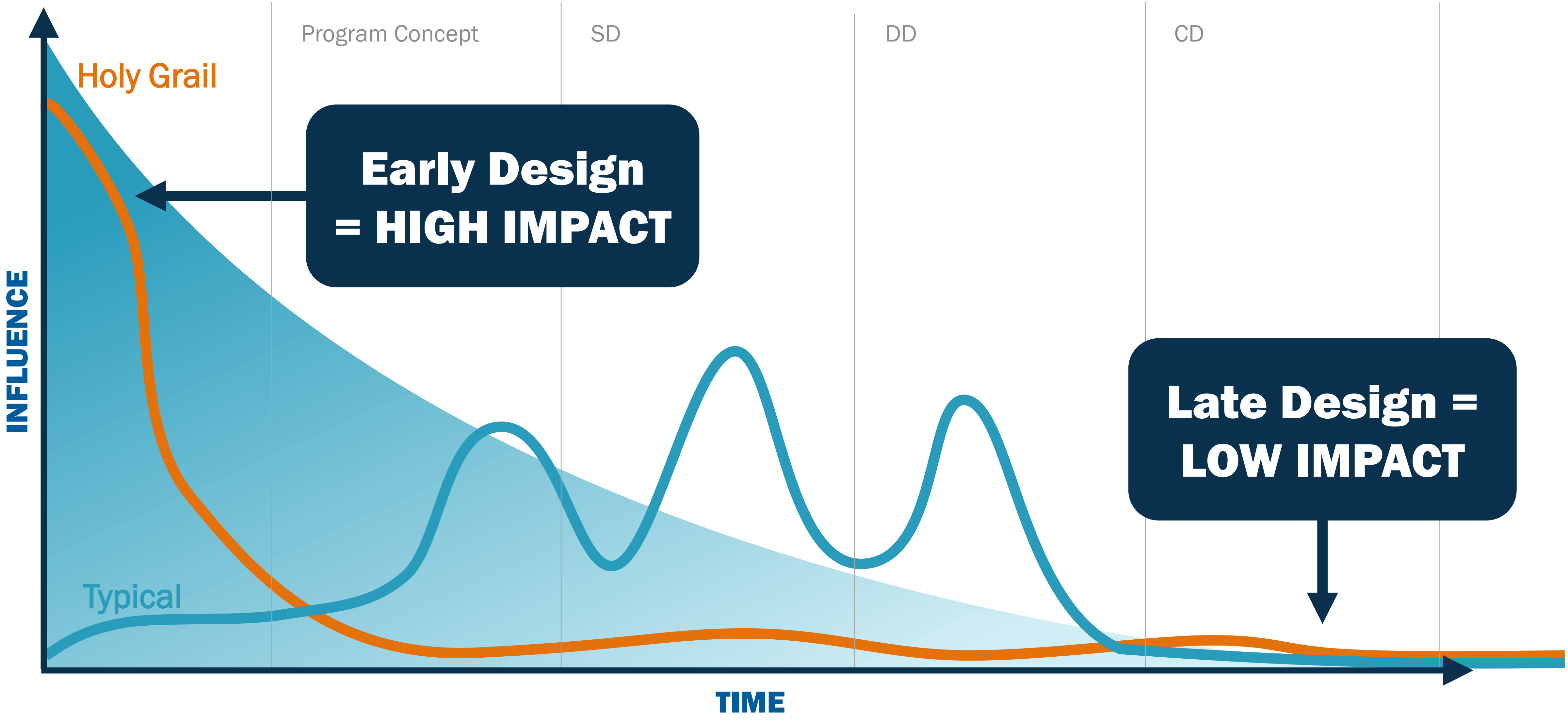
MORE PRICE STABILITY
Mass timber pricing has been far more stable than steel—enabling better cost certainty from design through construction.

BUILDS AMERICAN STRENGTH
Mass timber is sourced from U.S. forests and manufactured domestically—supporting local jobs, reducing supply chain risk, and strengthening our economy.

RENEWABLE. SUSTAINABLE
Wood is a renewable resource that stores carbon. Mass timber buildings have a significantly lower carbon footprint than steel.

Architect Value

Impact Happens Early



What Architects Influence Early

PERFORMANCE

- Fire strategy
- Moisture
- Acoustics
- Carbon
- Cost

SYSTEM

- Grid
- Spans
- Panelization
- Construction Type
- Exposed timber intent

INTEGRATION

- MEP routing
- Penetrations
- Connection & Fasteners
- Ceiling
- Envelope

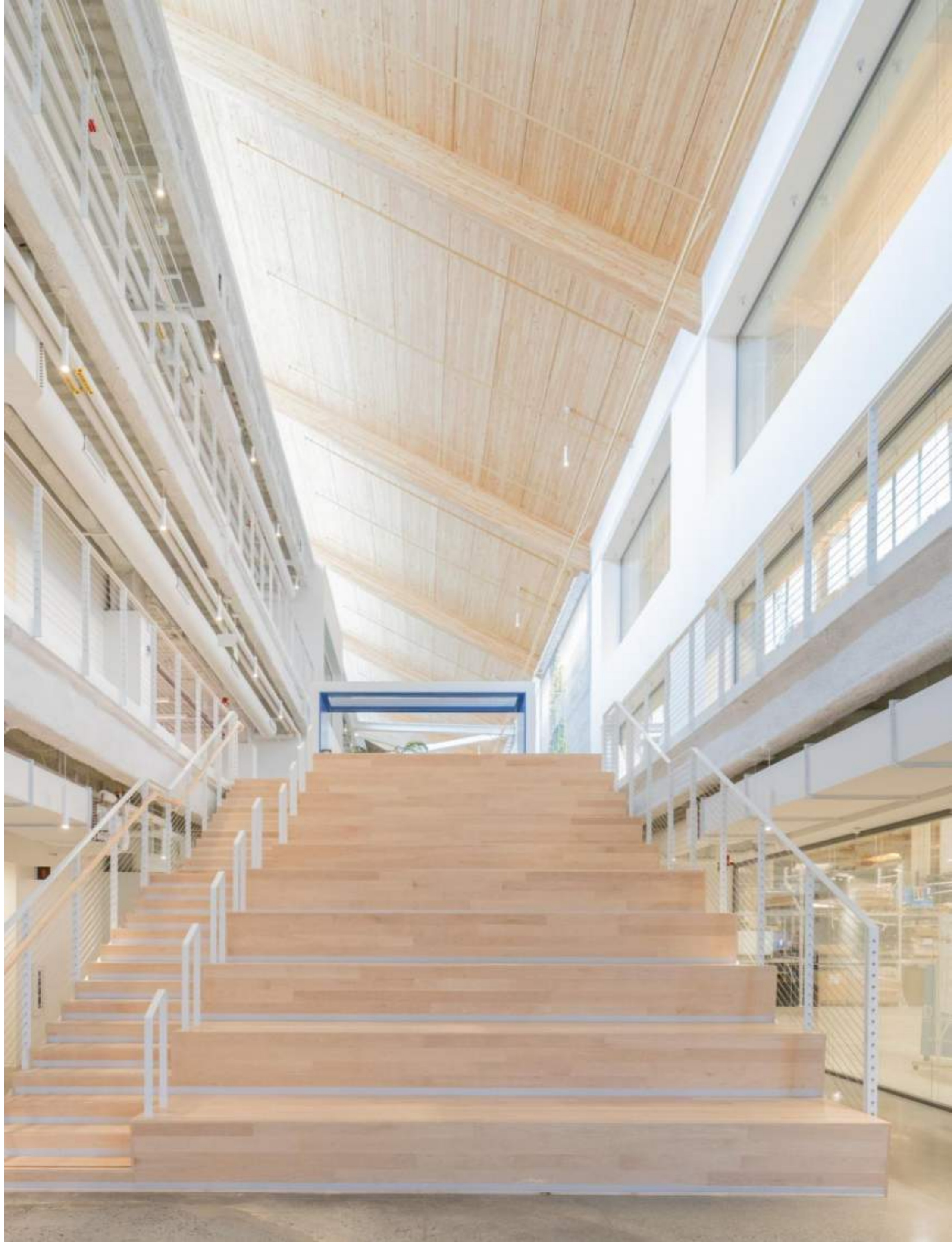
COST & DELIVERY

02

Material vs. System

MATERIAL THINKING		SYSTEMS THINKING
Swap Structure	→	Define early
Adjust later	→	Align everything

Mass timber is a *system*, not a material.
Early definition drives outcomes.



Critical Elements of a Systems Approach

What must be defined early for the system to hold

Moisture Mitigation Plan

Defined early, not managed later

- Enclosure strategy defined early
- Temporary + permanent conditions aligned
- Ownership clear (Architect / GC / Manufacturer)

Logistics & Sequence

Design drives installation

- Crane-driven install sequence
- Delivery aligned to pick order (JIT)
- Storage, handling, and protection defined
- Assembly efficiency built into design

Fasteners, Inspections & QA

Installation is part of the system

- Screw patterns defined in design
- Templates + color coding for consistency
- Inspection tied to install sequence
- Backup engineering for alternate fastening

Fabrication & Model Alignment

Model = instructions

- LOD 400 aligned with manufacturer
- CNC constraints embedded in design
- Connections and tolerances resolved

Procurement & Risk

Procurement tied to production

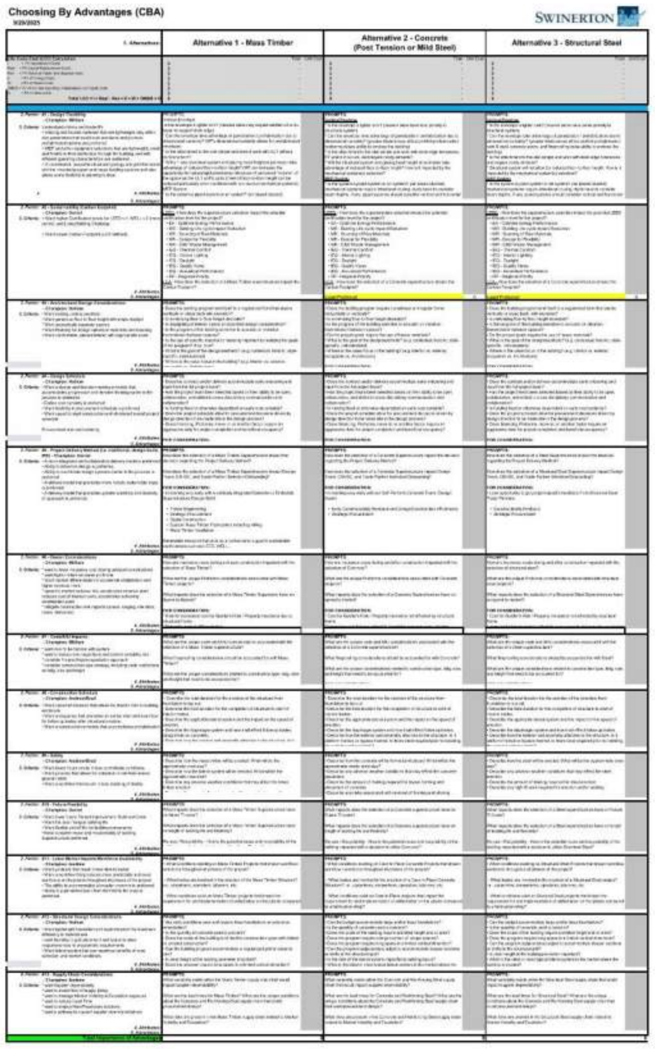
- Early deposits secure manufacturing slots
- Procurement aligned with fabrication schedule
- Builder's risk aligned to system
- Exposure windows defined early

Prefabrication Integration

Enabled by early definition

- MEP racks, facade, assemblies integrated early
- Trade work shifts offsite
- Interfaces defined before fabrication

Value Proposition: VALUE > COST


Choosing By Advantages (CBA)

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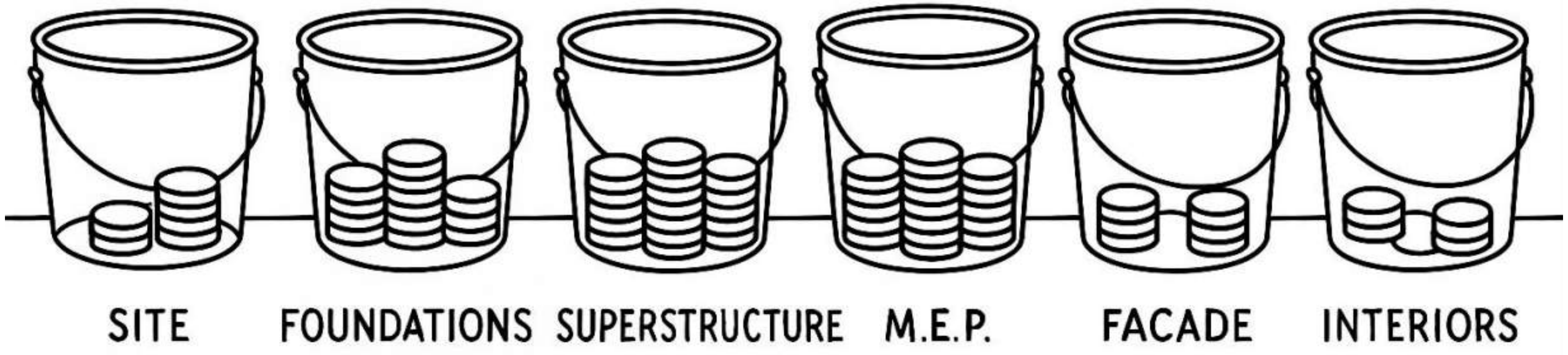
Alternative 1 - Mass Timber	Alternative 2 - Concrete (Post Tension or Mild Steel)	Alternative 3 - Structural Steel

CHOOSING BY ADVANTAGE

1. Owner Considerations
2. Code & AHJ Impacts
3. Project Delivery Method
4. Future Flexibility
5. Sustainability
6. Architectural Design Considerations
7. Structural Design Considerations
8. Design Flexibility
9. Design Schedule
10. Construction Schedule
11. Safety
12. Labor Market & Workforce Availability
13. Supply Chain Considerations

TARGET VALUE DESIGN



Cost Delta Analysis: ALWAYS More than Structure

- ✓ Building Mass
  - ✓ Foundations
  - ✓ Gravity vs. Lateral
- ✓ Interior
  - ✓ Finishes
  - ✓ Acoustics
- ✓ Exterior
  - ✓ Building Height
  - ✓ Envelope
- ✓ General Conditions
  - ✓ Schedule
  - ✓ Crane
  - ✓ Moisture Mitigation
  - ✓ Cleaning

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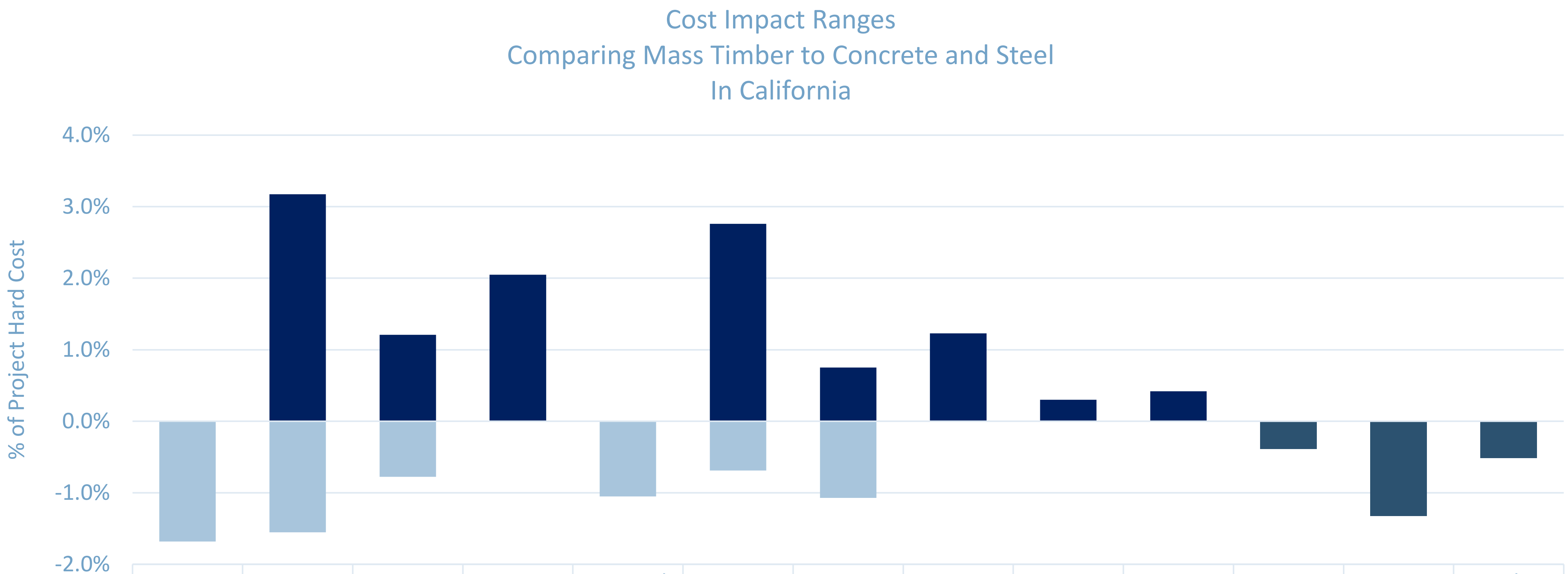
Steel vs Mass Timber Study (ROM)

SIDE BY SIDE SUMMARY

November 24, 2025

Description	Steel per 100% SD	Mass Timber Option	NOTES
A10 FOUNDATIONS			
Spread Footing, 4.17' x 4.17' x 30" deep	3 CY		
Spread Footing, 7.17' x 7.17' x 30" deep	29 CY		
Spread Footing, 9.17' x 9.17' x 30" deep	31 CY		
Grade Beam, 12.17' x 42" deep	484 CY		
Spread Footing, 5.5' x 5.5' x 18" deep	NOT REQ'D	55 CY	
Grade Beam, 12.17' reduce width by 10% x 42" deep	NOT REQ'D	436 CY	Assumed to be 10% less on width
Slab on Grade	NO CHANGE	NO CHANGE	
Miscellaneous - elevator pit, equipment pads, etc.	NO CHANGE	NO CHANGE	
B10 SUPERSTRUCTURE			
Structural Steel - 12.5#/SF	180 TN	27 TN	TIMBER - ALLOW FOR 15% OF STEEL
Structural Steel - BRBS, allow for 4#/SF	58 TN)	53 TN)	Assumed to be 10% less
BRB 8-3 IN SQ	10 EA	9 EA	
BRB 10-5 IN SQ	11 EA	10 EA	
BRB 10-8 IN SQ	2 EA	2 EA	
BRB 12-7 IN SQ	1 EA	1 EA	
BRB 12-12 IN SQ	2 EA	2 EA	
4.75" THK Slab on Metal Deck	29,099 SF	NOT REQ'D	
Metal Decks, 3"	29,099 SF	NOT REQ'D	
Gypcrete and Acoustimat, 2" THK over 5/16" at 2nd Floor	NOT REQ'D	14,143 SF	
Fireproofing	209 TN	NOT REQ'D	
CLT, GL, and Hardware Supply	NOT REQ'D	31,825 SF	Includes Extension of Roof Canopy across Entry to dashed line
Temporary Engineering, Install of CLT, GL, Hardware Supply, and Crane	INCLUDED ABOVE	31,825 SF	
Drag Plate Supply & Install Allowance	NOT REQ'D	1 LS $	
Perimeter Beams	NOT REQ'D	1 LS	
Deduct Canopy Framing & CLT & GL Lobby Columns	NOT REQ'D	(1) LS $	Includes Extension of Roof Canopy across Entry to dashed line
C30 INTERIOR FINISHES			
Wall: Acoustical Panel, Filz Felt Rain Panel	NO CHANGE	NO CHANGE	At Lobby
Wall: Ekoa Core Collection Wall Panels	4,333 SF	NOT REQ'D	At Corridor
Wall: Paint to Wall		4,333 SF	At Corridor
Wall: Acoustical Wall Panels at Non-Carpet Classrooms - allow x perimeter x 9' H x 25%	NO CHANGE	1,766 SF	At Physical Sciences, Shared Lab, Workrooms Block
Floor: Sealed Concrete	NO CHANGE	NO CHANGE	
Floor: Resilient Flooring	23,263 SF	5,393 SF	At Physical Sciences, Shared Lab, Workrooms Block - Mass Timber Option
Floor: Carpet Flooring	1,876 SF	17,870 SF	Change Classrooms to Carpet Flooring
Ceiling: Suspended Acoustical Ceiling Panel System, 2x2 (APC-1) - offices, storage, faculty	4,595 SF	2,067 SF	At Corridor
Ceiling: Suspended Acoustical Ceiling Panel System, 1x6 (APC-2) - classroom	13,390 SF	NOT REQ'D	
Ceiling: Acoustical Baffle Ceiling, 3" (APC-4)	1,556 SF	1,556 SF	At Corridor
Ceiling: Suspended Gypsum Board Ceiling	NO CHANGE	NO CHANGE	
Ceiling: Gypsum Board Ceiling, Soffit	NO CHANGE	NO CHANGE	
Ceiling: Laminated Gypsum Board at Concealed Spaces	NOT REQ'D	4,763 SF	
Ceiling: Paint to Open Structure and Gypsum Board	NO CHANGE	NO CHANGE	
Ceiling: CLT Sealer	NOT REQ'D	31,825 SF	
D20 PLUMBING	NO CHANGE	NO CHANGE	
D30 HVAC - Premium for Exposed Ductwork	NOT REQ'D	29,162 SF	
D40 FIRE PROTECTION	NO CHANGE	NO CHANGE	
D50 ELECTRICAL	NO CHANGE	NO CHANGE	
Subtotal - Direct Construction Cost			
INDIRECT MARK-UP'S 30%			
Total Construction Cost - Affected Trades			
		2.09%	**STRUCTURAL**
		0.35%	**OVERALL**

Potential Trade Impact on Project Hard Cost



	Foundations	Vertical Structure	Lateral Structure	Floor Acoustics	General Conditions	Fire Protection	Facades	Podium	Roofing	Builders Risk	Carbon	Biophillia	Market Differentiation
Savings	-1.7%	-1.6%	-0.8%	0.0%	-1.1%	-0.7%	-1.1%	0.0%	0.0%	0.0%	-0.4%	-1.3%	-0.5%
Premium	0.0%	3.2%	1.2%	2.0%	0.0%	2.8%	0.8%	1.2%	0.3%	0.4%	0.0%	0.0%	0.0%

Long-Term Benefits

On job offer acceptance rates since opening
Walmart's new 350-acre corporate campus in **Bentonville, AK**:

"…we have seen a 3x increase in [job offer] acceptances from new graduates since moving into our new campus…"

- Chrsti Gallager, Director, Walmart Corporate Real Estate and Visitor Experience

PROCESS

03

Timber First

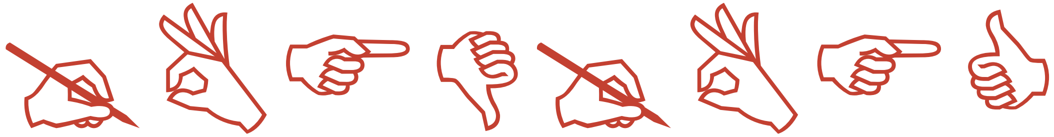
(One-Way Street)

1. *Start* Timber → *Stay* Timber = ✓
2. *Start* Timber → *Shift* to steel or concrete = *Okay* (minimal impact)
3. *Start* steel or concrete → *Shift* to Timber = **Breaks system* → **It can still be done but comes with significant impact.*

Workflow Shift
Same Project, Different Timing

Traditional Approach
Defined ***<u>During</u>*** Construction

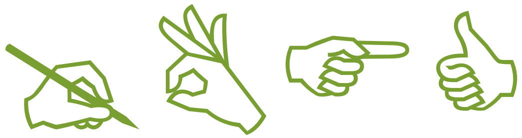
- ✓ System selected during design
- ✓ Coordination continues through documentation
- ✓ Conditions resolved in the field
- ✓ Moisture managed during construction



vs.

Mass Timber Approach
Defined ***<u>Before</u>*** Construction

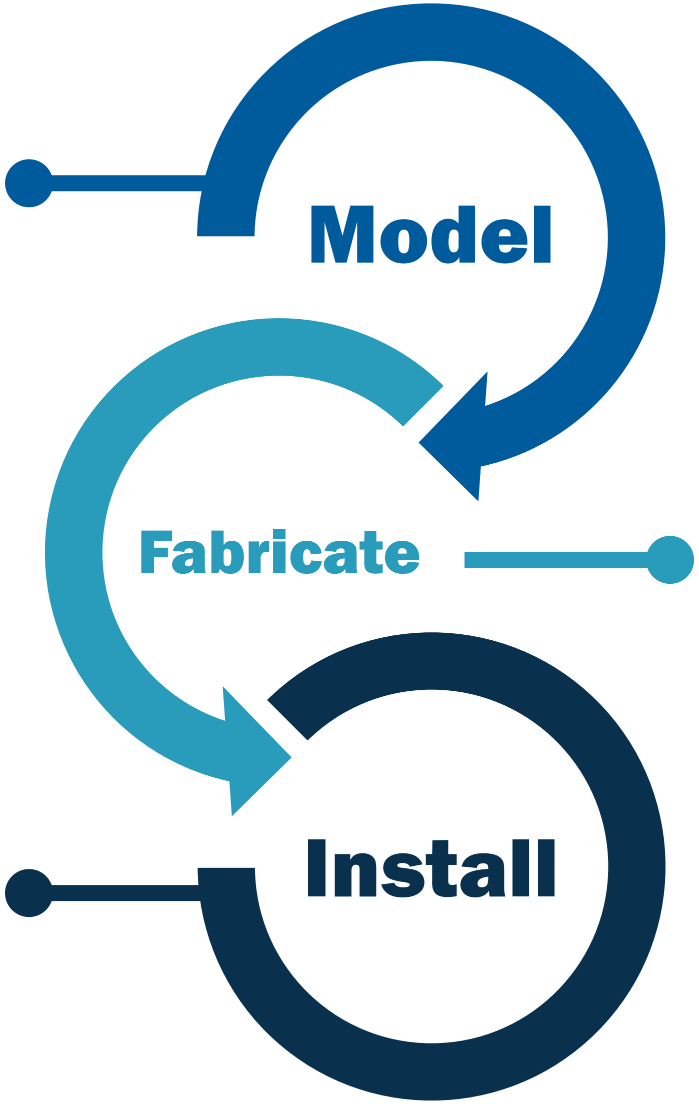
- ✓ System defined early (Timber first)
- ✓ Design carries through to fabrication
- ✓ Coordination resolved before installation
- ✓ Moisture management plan as part of the system



DfMA Approach

Who: Architect-led, full team aligned, Owner, Engineer, GC, Manufacturer, Trades, VDC

When: SD 0–30%, DD 30–70%, early CD 70–80% (to LOD 400 alignment)



Who: Manufacturer-led, aligned with Engineer, GC, Trades, VDC

When: Late CD 70–90%, IFC 90–100%

Who: GC-led, Installer/Erector, Trades, QA/QC, Manufacturer support

When: IFC 90–100% through construction

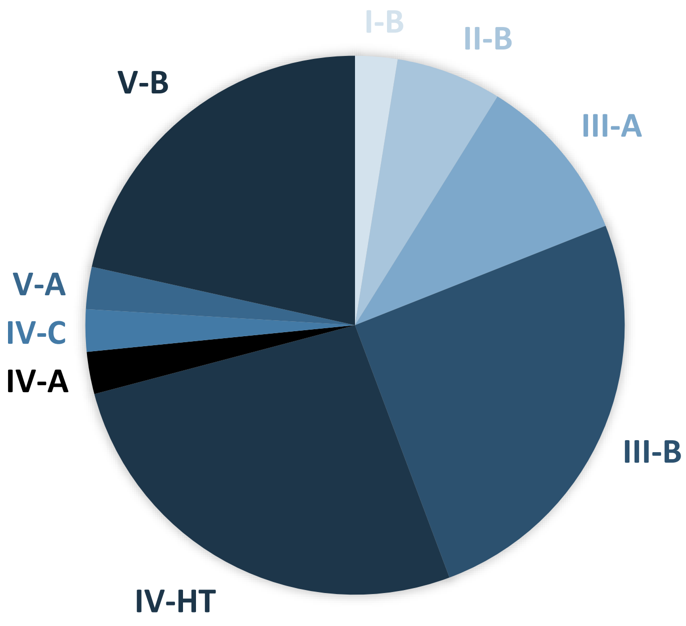
DESIGN *BEFORE* BUILD

The model is still design intent, it just gets defined to a level that **supports manufacturing and assembly**.

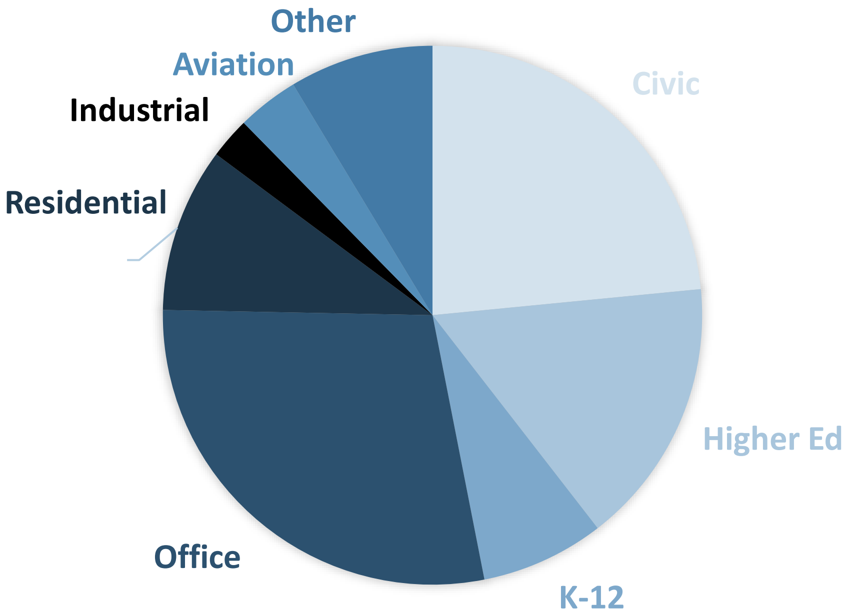
This isn't about adding more detail, it's about **defining the right things earlier**.

The First 40

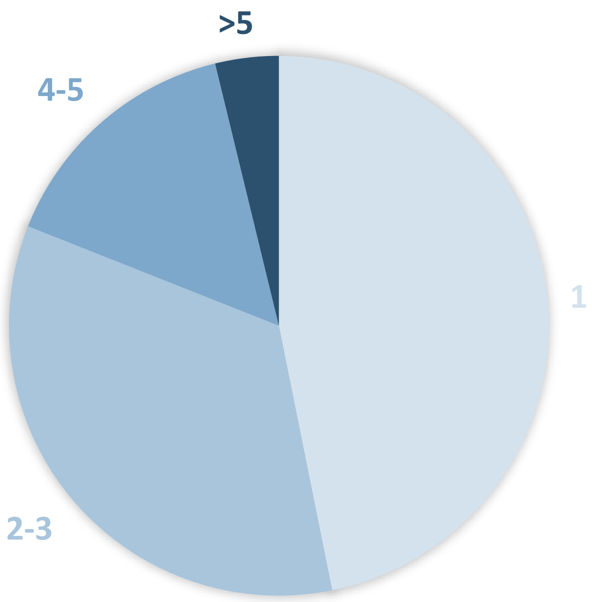
CONSTRUCTION TYPE



BUILDING USE



STORIES



Construction Type

Chapter 5: How much building are you trying to build?
- height, number of stories, and floor area

Chapter 6: Construction TYPE is a cost driver
- **Wood fiber volume = Cost**
- FRR = Volume
- TYPES III & V **over IV, and B over A**

$ >>> Increasing Fiber Volume >>> $$

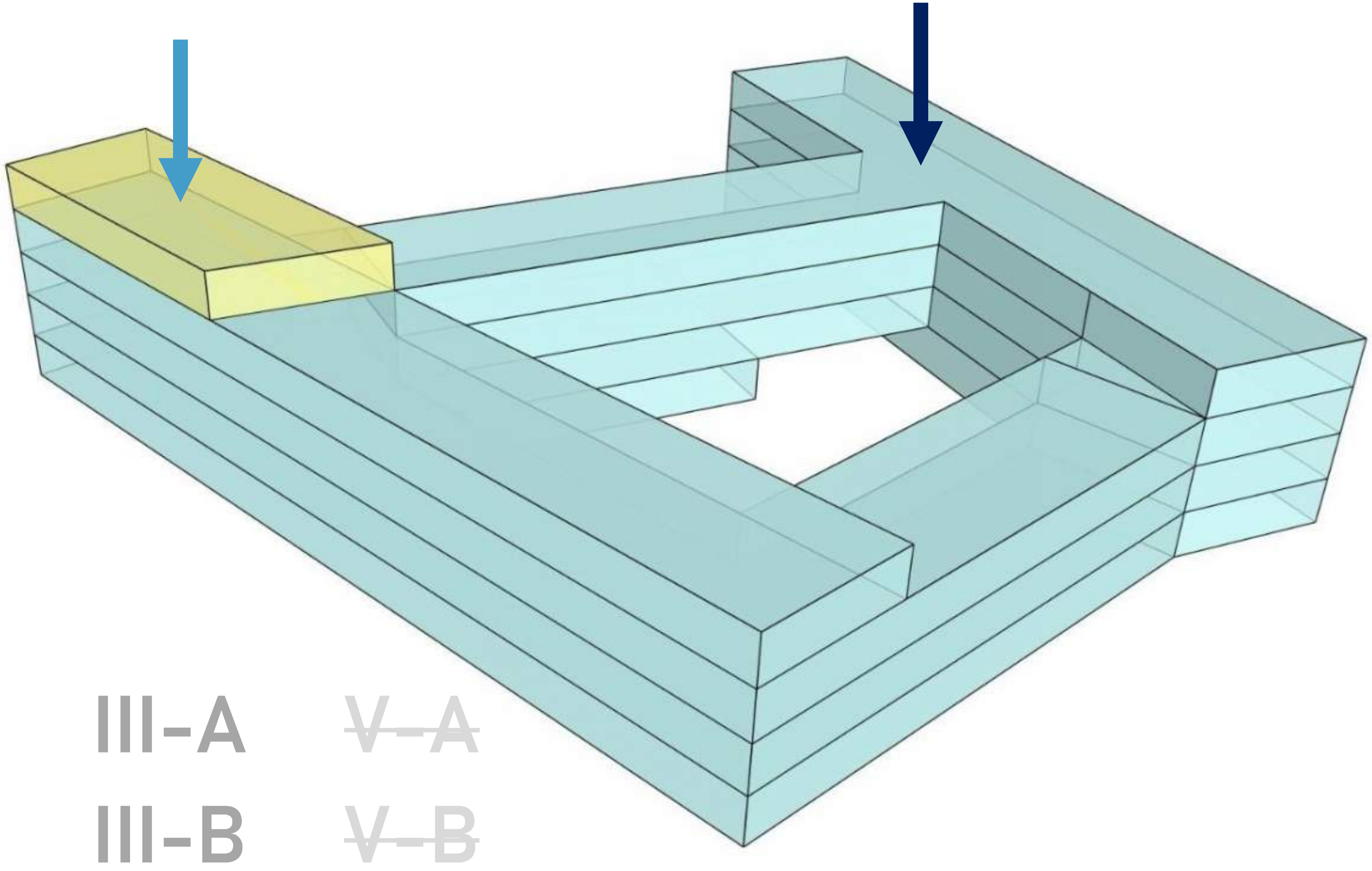
V-B III-B IV-HT V-A III-A IV-C IV-B IV-A

Minimizing Fiber Volume

Challenges

1. Overall building area

2. Assembly use above level 4

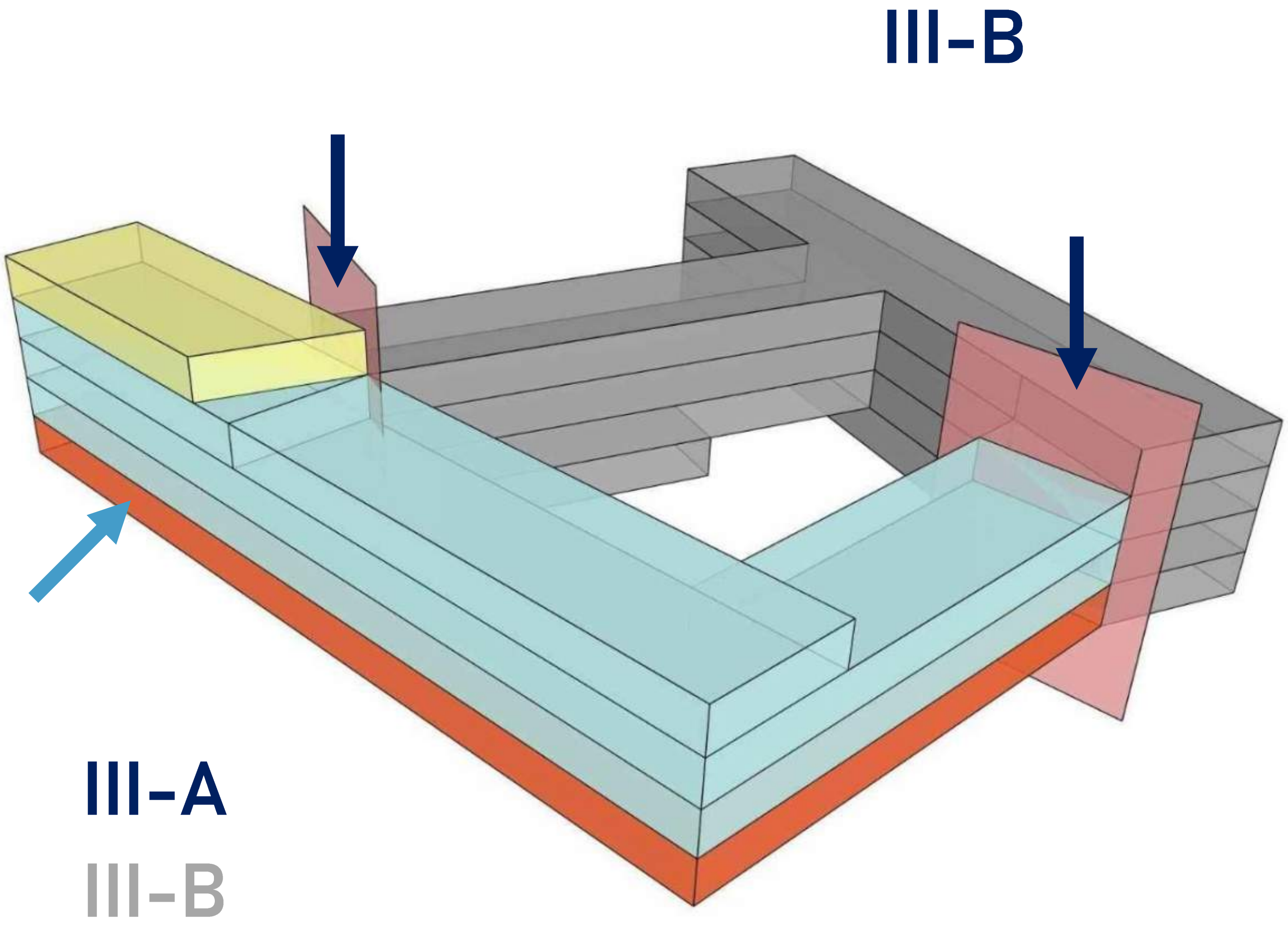


Minimizing Fiber Volume

1. Overall building area
   - Building separations
2. Assembly use above level 4
   - TYPE I Concrete Podium

Now mass timber is possible…
Can we improve the solution?

3. Requires concrete podium



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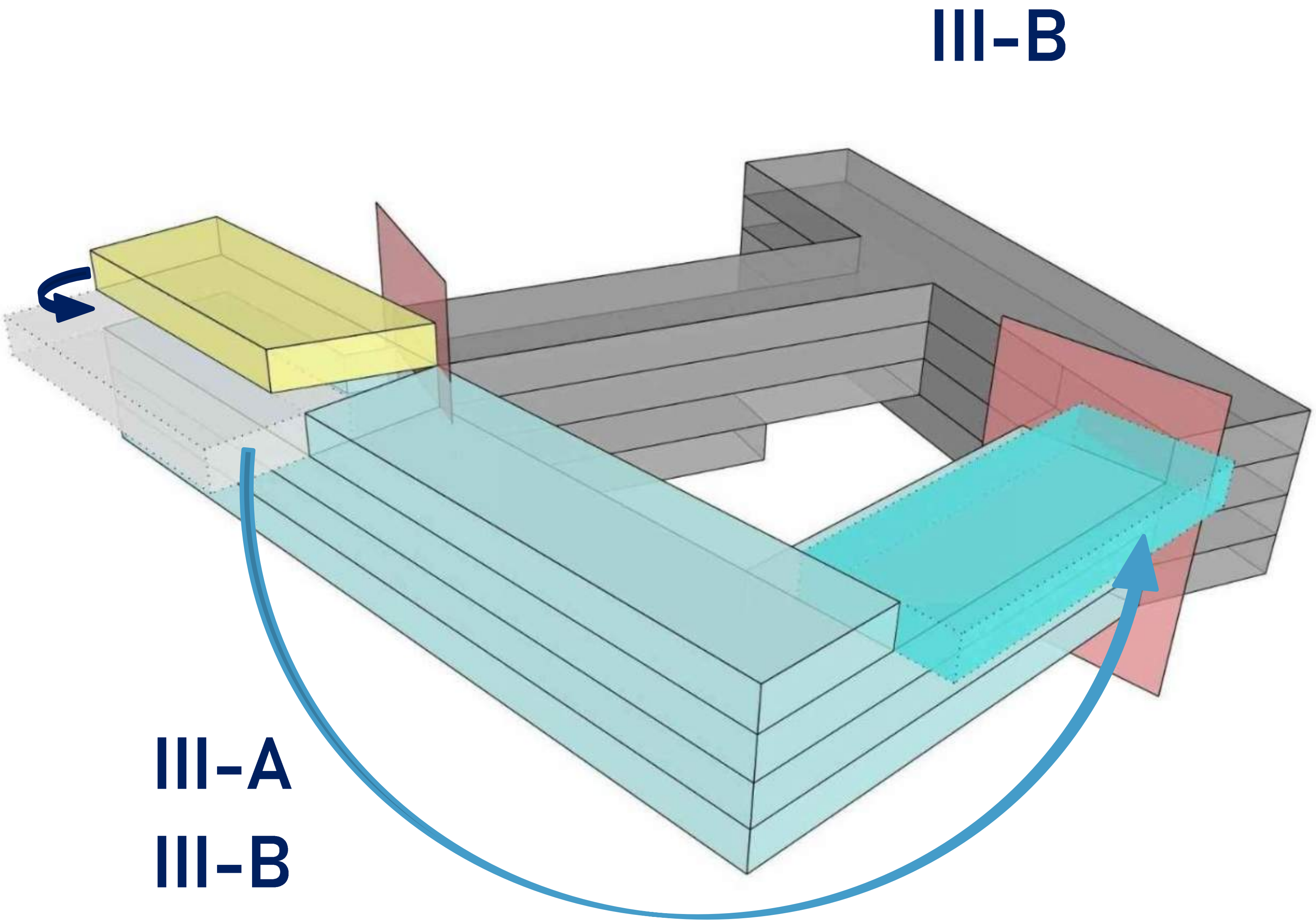
3. Requires concrete podium
   - Shift R-2 occupancy
   - Lower A-3 occupancy



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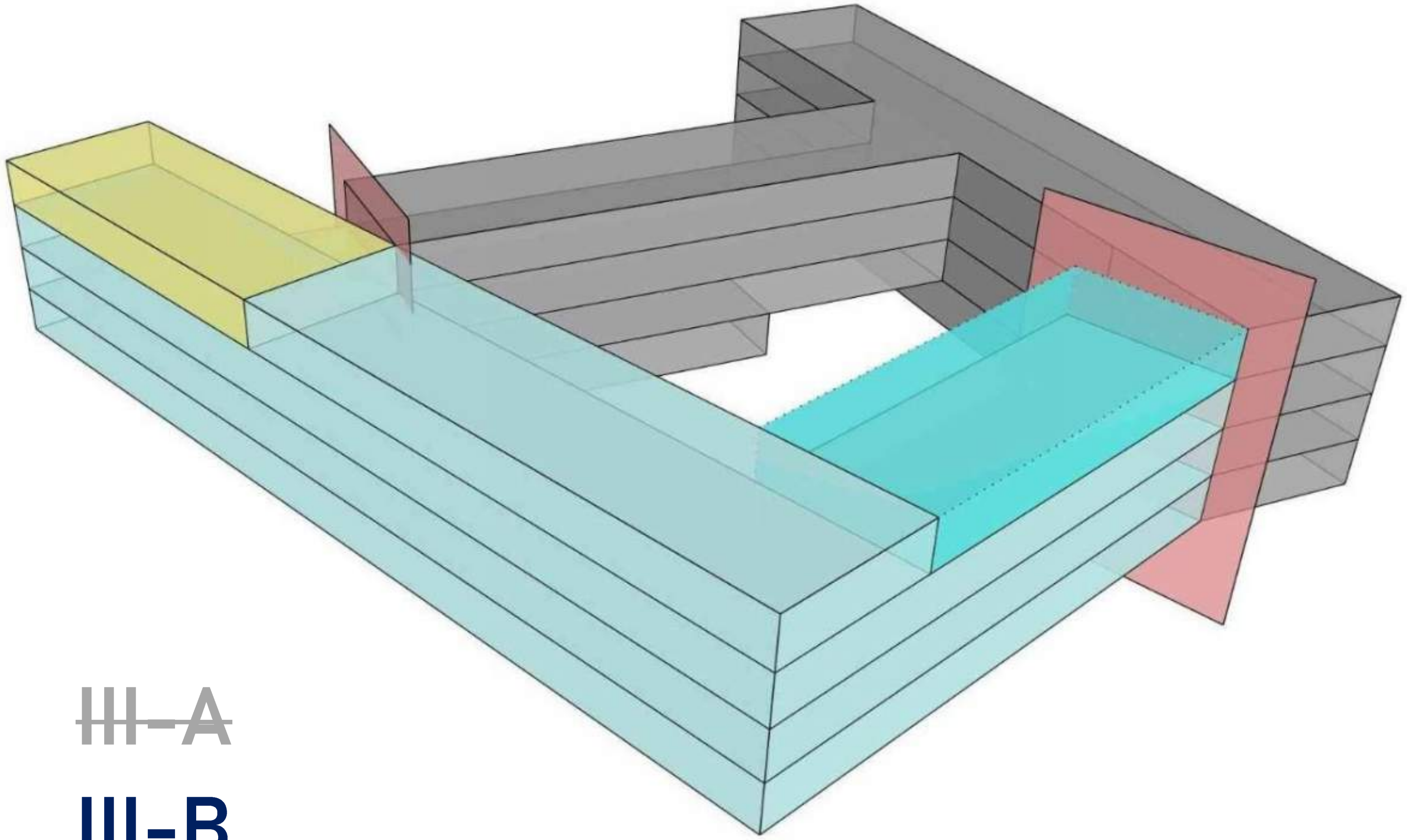
III-B



~~III-A~~

III-B

DELIVERY METHODS

04

Questions to ask Before SD Ends

Lock These Decisions

- Structural grid and spans committed (drives panel sizes and repeatability)
- Construction Type and target fiber volume set (Type III/IV, FRR)
- Exposed vs. concealed timber defined (drives finish, fire, and connection strategy)
- MEP routing strategy chosen racks, penetrations, ceiling zone
- Moisture mitigation ownership assigned (Architect / GC / Manufacturer)
- Manufacturer engaged and production slot reserved

SO, THE QUESTION IS:

When does risk get addressed...during construction or earlier in design?

(Perceived) Risks – Fire & Water


Photo Courtesy WoodWorks

AH-HA MOMENT:

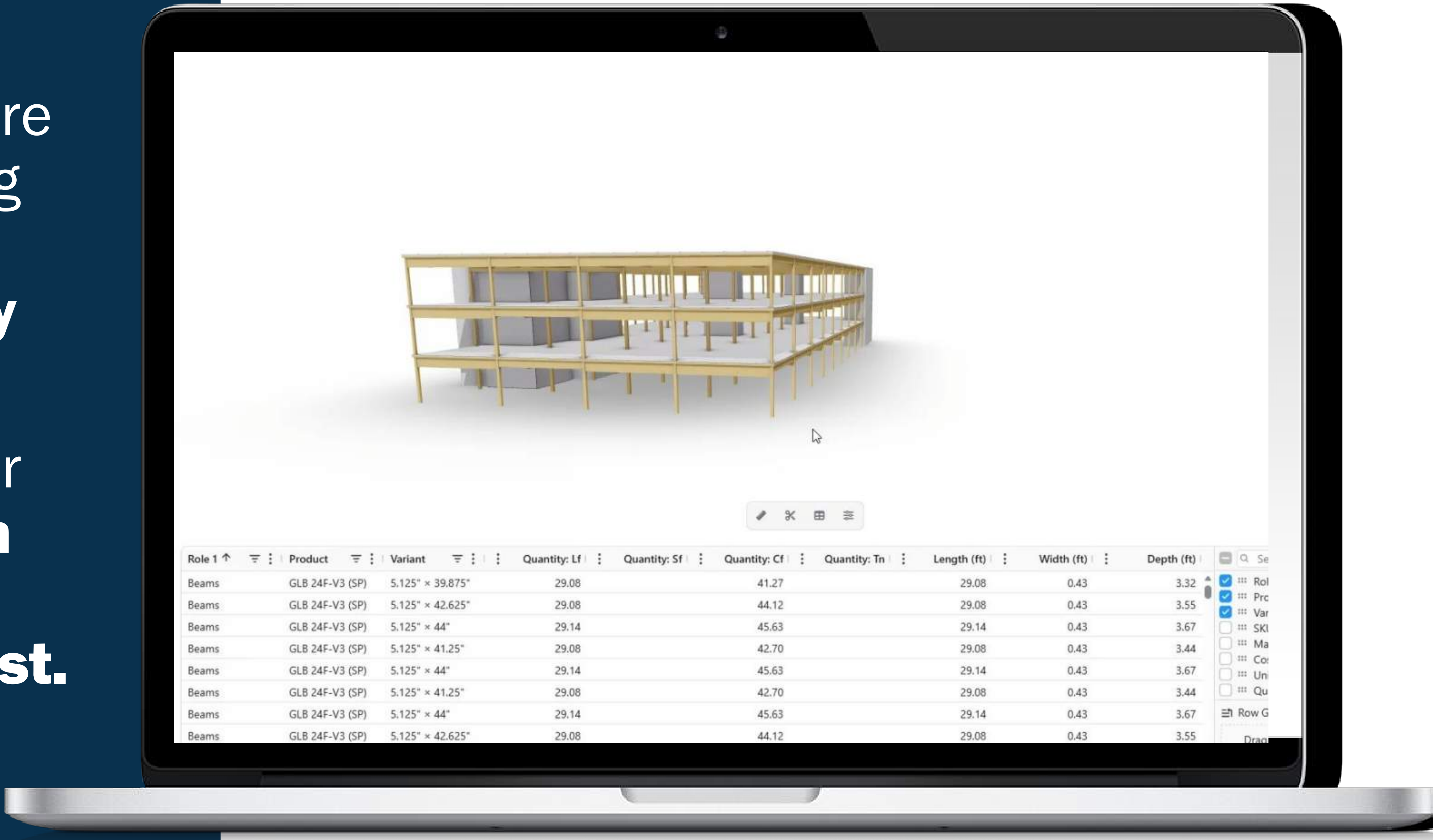
The difference is not what gets solved...

it’s ***when*** it gets solved.

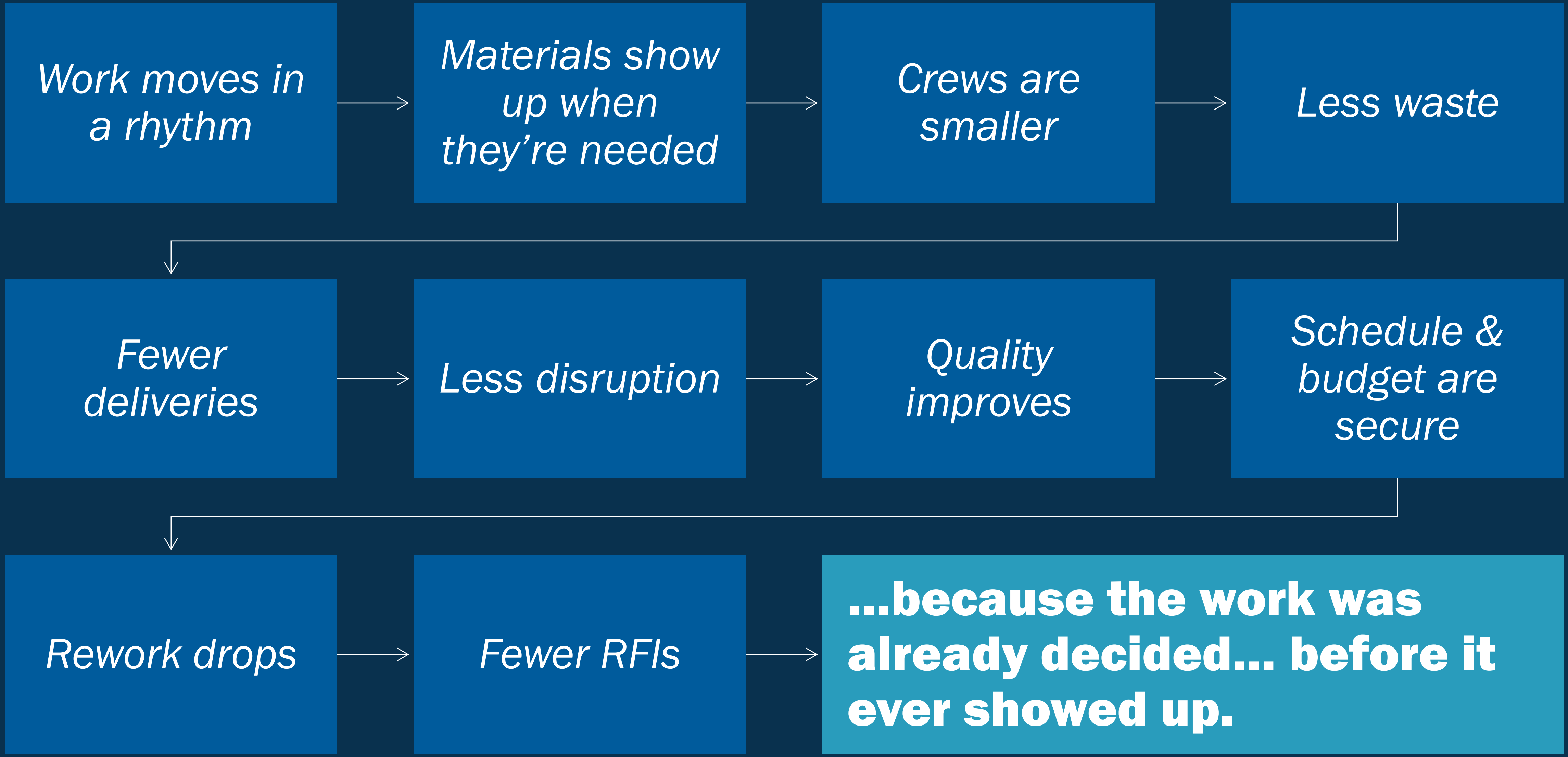
SETTING THE STAGE...

Architects are coordinating **more complexity** than ever.

Mass timber shifts **when decisions matter most.**



When the system is defined...



WHEN THE SYSTEM IS DEFINED

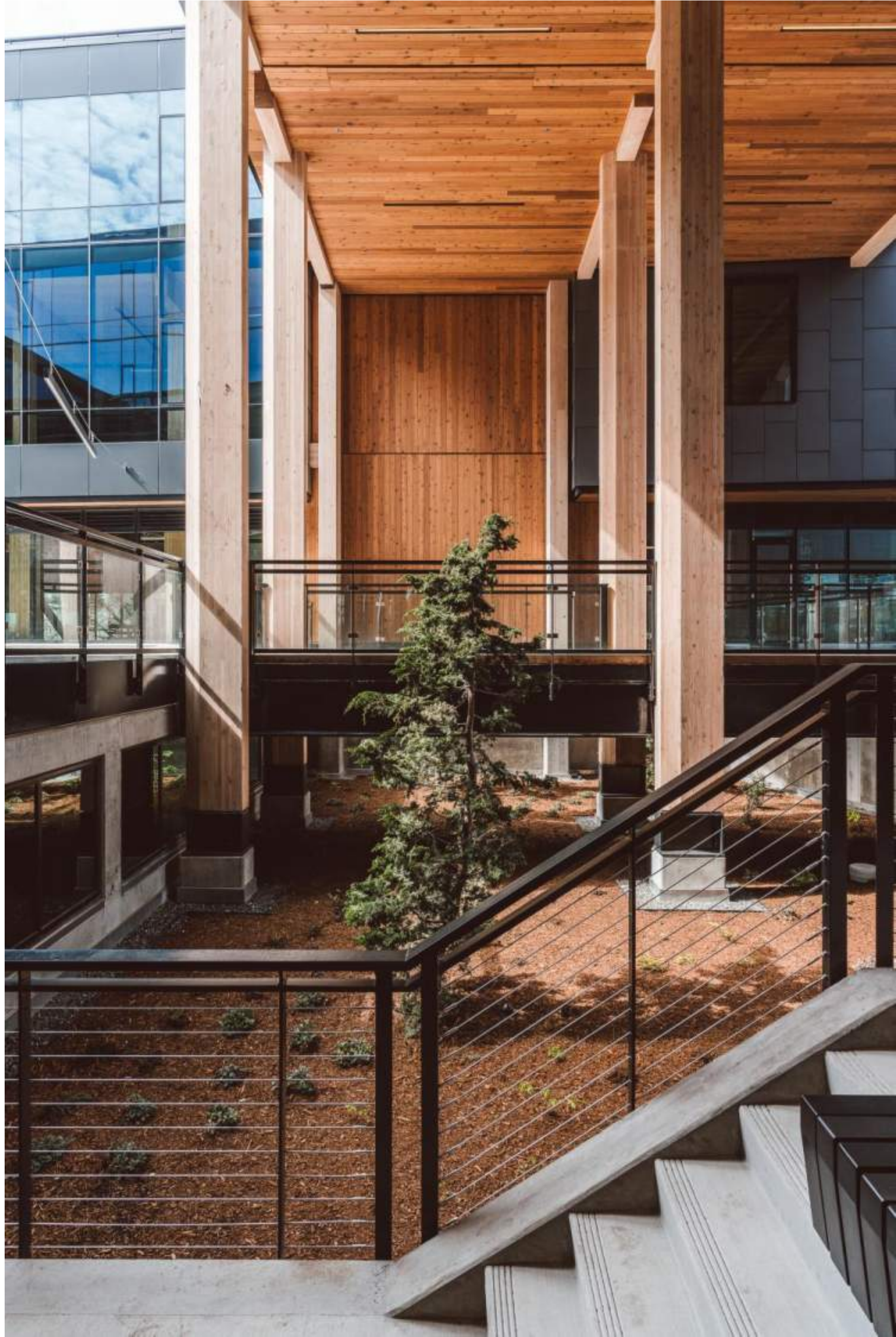
Design ***leads.***
The field ***executes.***

Final Thoughts

1. **Early cross-disciplinary engagement** is a key factor in the success of mass timber projects.

   Because…

2. Mass timber projects do not fail because of the cost of mass timber. **Mass timber projects fail because the mutual benefits of other building systems are not leveraged.**



Process

Innovation Sequence

Integration Alignment Coordination

Collaboration

Systems Assembly Partnership

Communication Early

Teamwork

Connect With Us

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This concludes The American Institute of Architects Continuing Education Systems Course.