

Schedule Management

Presented by Erica Spiritos and Graham Montgomery



Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.

Learning Objectives

Schedule

Design Completion

- Speed of design completion needs to consider time for constructability review and adjustments.
- Ideally, the project delivery method allows to bring on structural + MEPF trade partners prior to design completion
- If project delivery method does not allow for early constructability review, budget more time for RFIs and shop drawings
- Example of constructability feedback: Designing to accommodate tolerances of concrete/steel. Many times, a ½" gap between steel/concrete and CLT is acceptable for clearance reasons but we have had bearing issues in the past and giving an inch of play on each side should be our goal going forward.
- Basis of design must consider that Manufacture availability is ranging 3-10 months out, a sole source design could delay the project schedule
- Consider time for 3rd party fire / code review and adjustments

Trade Coordination

- Other structural trades must have shop drawings and corresponding 3D model approved / "locked" for fabrication before timber detailing starts – or risk rework
- The MEPF model sign off procedure needs to be completed with a finish to finish relationship with mass timber shop drawing review, assuming "as late as possible"
- The goal is that coordination is occurring 3-6 months earlier in the project than conventional practice – this is a big shift

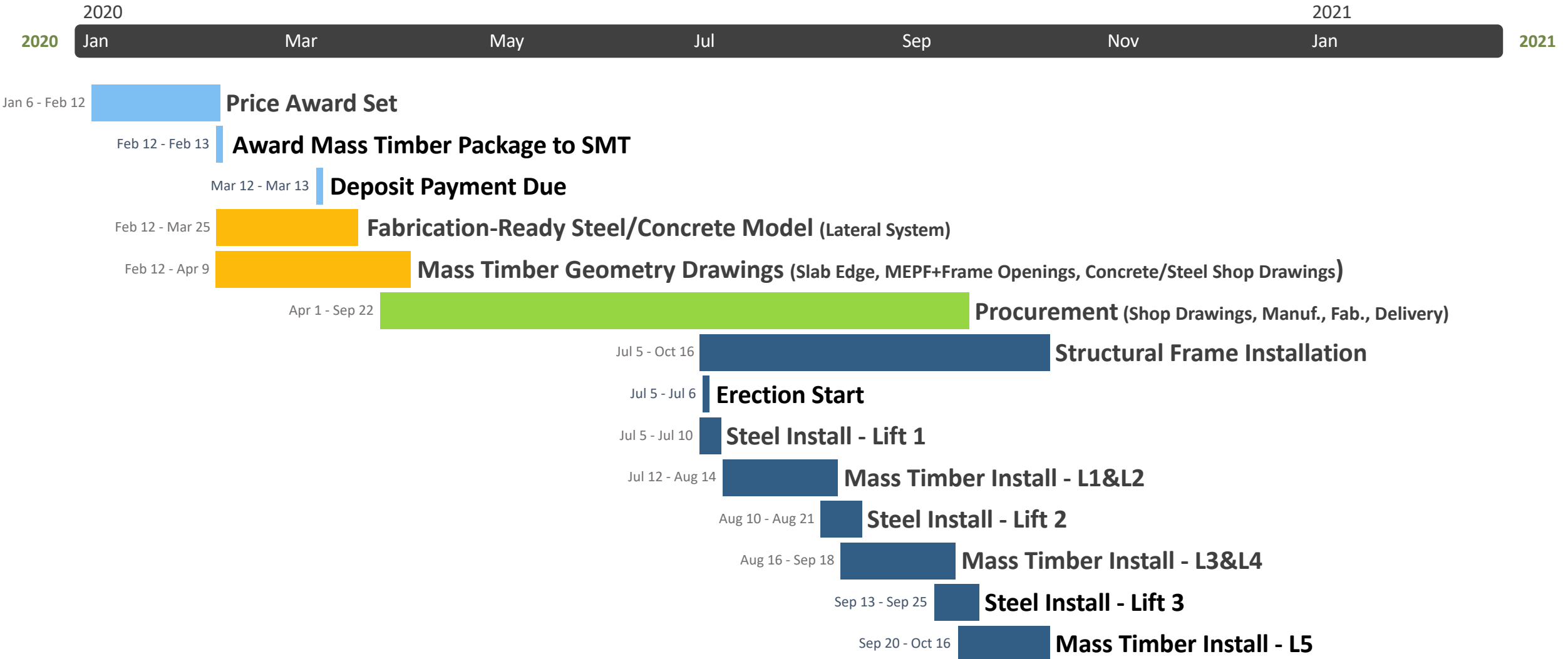
Procurement

- AEC team should plan for a big push to get through shop drawing review
- Lingering questions from shop drawing review could drag on for weeks or months if not addressed definitively
- Duration from shop drawings to production start varies by supplier
- Reconcile truck loading with construction sequence to reduce time for intermittent handling

Construction

- Logistics, laydown space, truck flow is critical to speed of installation. Tight sites and a lack of access to the crane dramatically decreases workflow and increases crew size. Space for crane and at minimum 1 truck in swing radius is needed.
- Best timing for construction is during dry months (varies by region) this timing is influenced by items 1, 2,3 above
- Advancing of permeant lateral system to stabilize frame as soon as possible and shorten duration of temporary bracing
- Prepare follow-on trades to take advantage of swift structure installation
- Install roof as quickly as possible

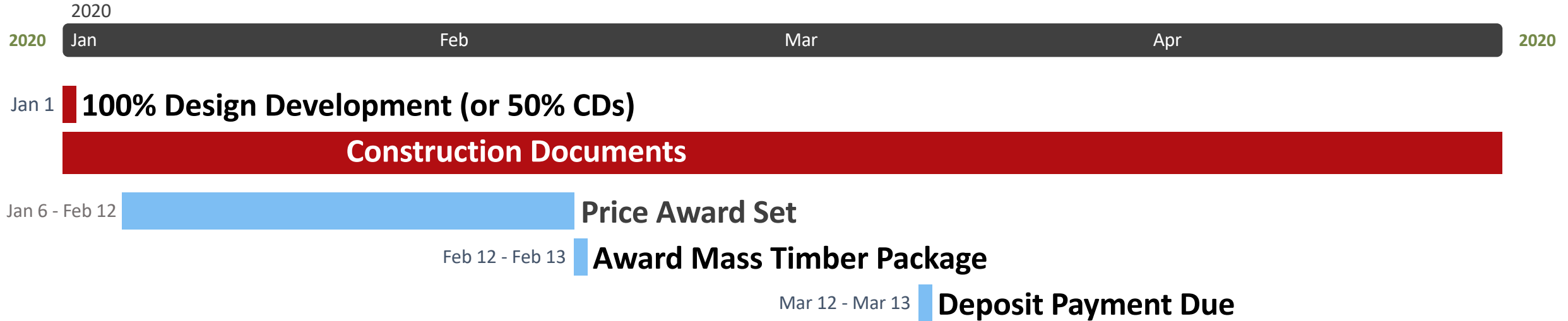
Project Schedule



TRADE PARTNER SELECTION

When do you bring on a vendor or subcontractor?

Project Award and Design Completion



Selecting a Trade Partner

Trade Partner Options

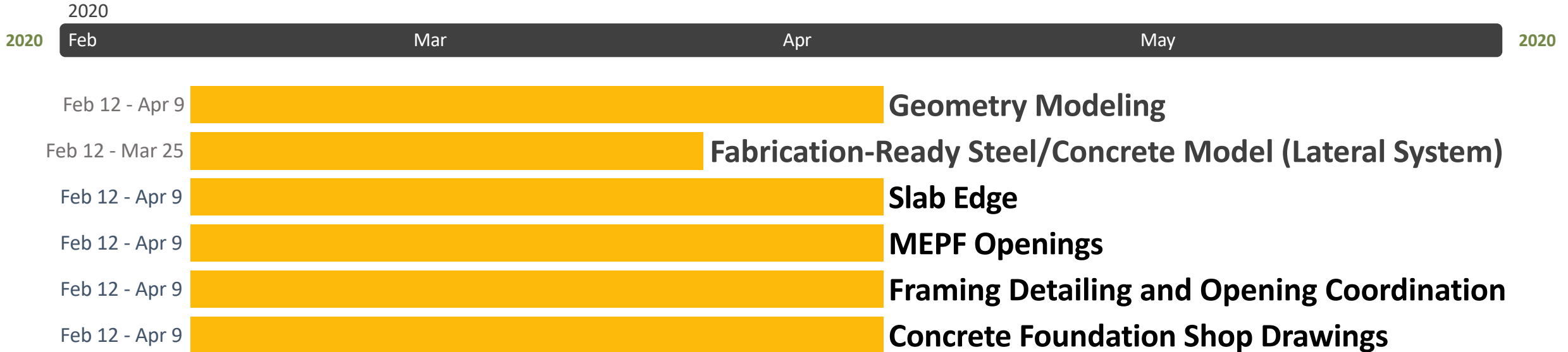
- Vendor Only
- Turnkey Provider



SHOP DRAWING PROCESS

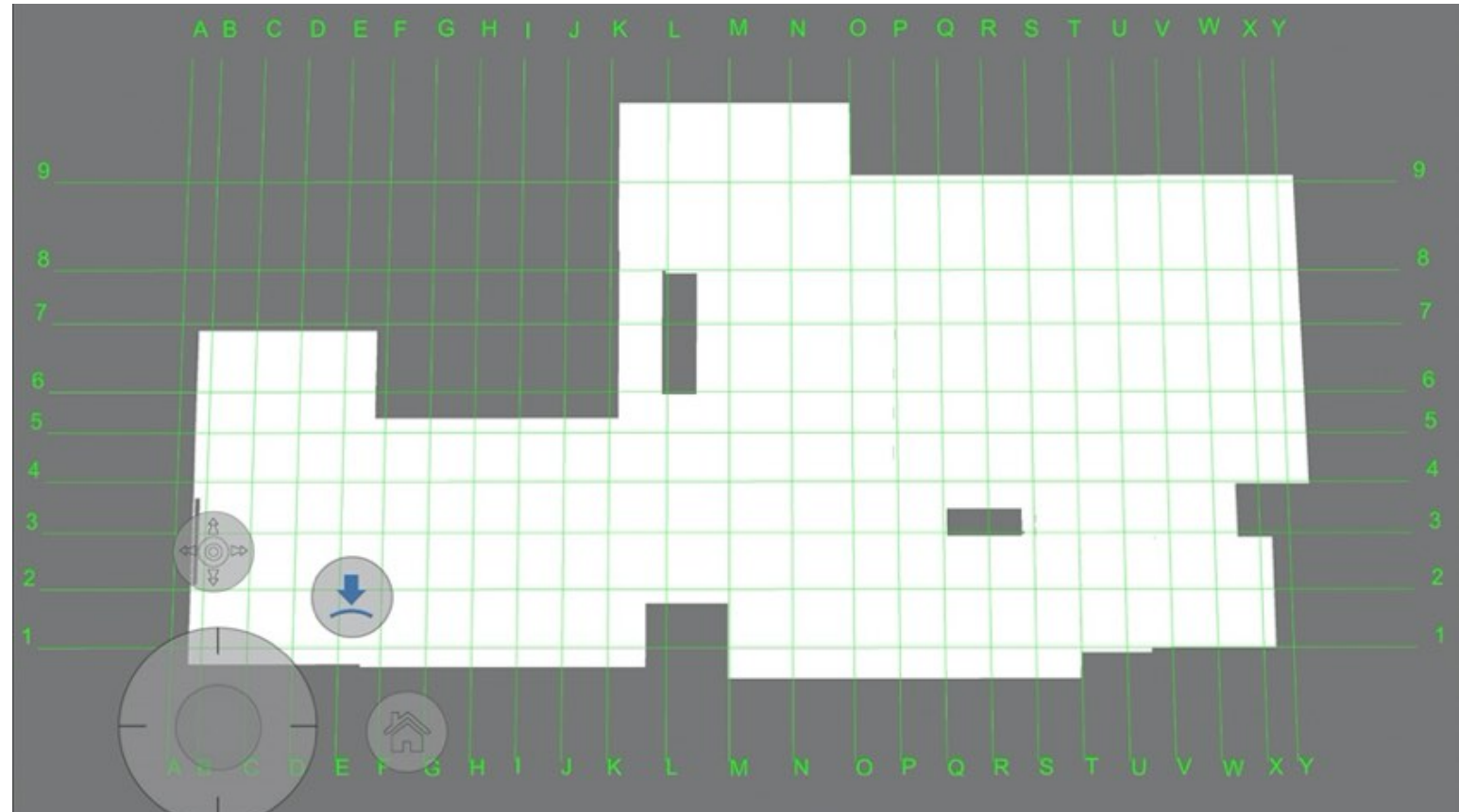
How much time will it take to get from here to fabrication-level 3D model?

Early Detailing Activities



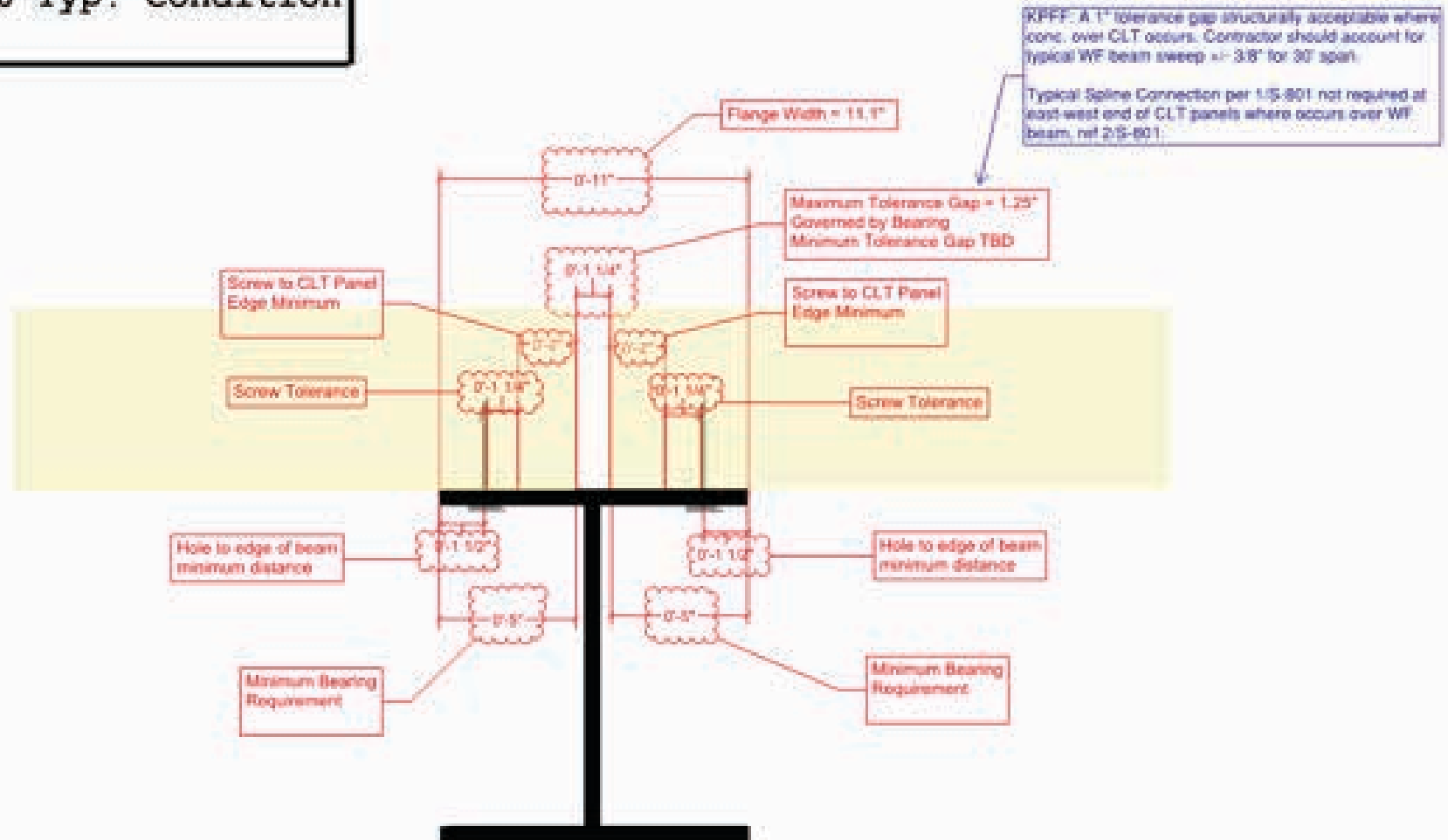
Geometry Model

- Geometry Model
- Architectural Intent?
- Where is the CLT Edge?
- Importance of a Slab Plan



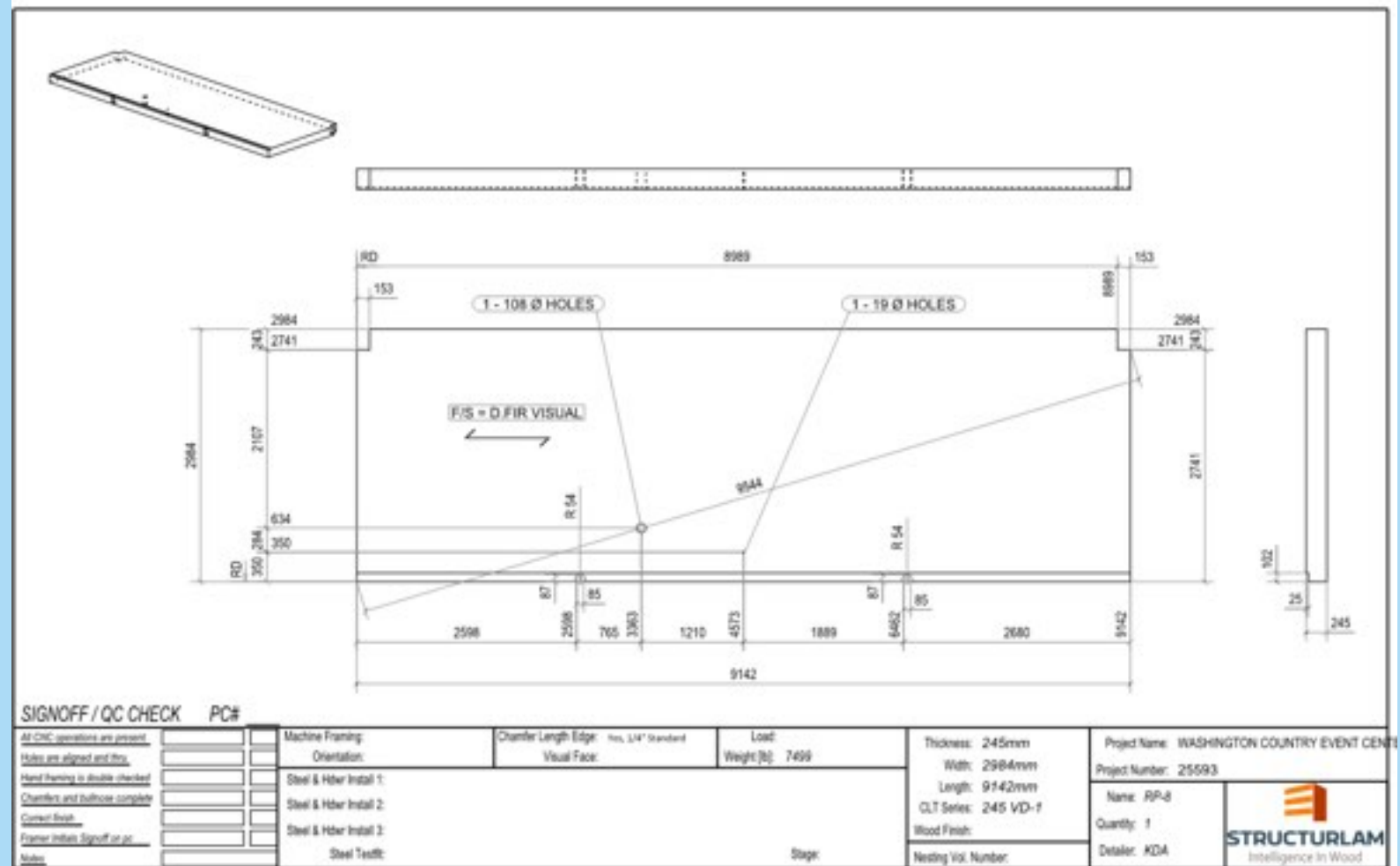
Constructability Feedback

W18x86 Typ. Condition




Early Award Trade Packages

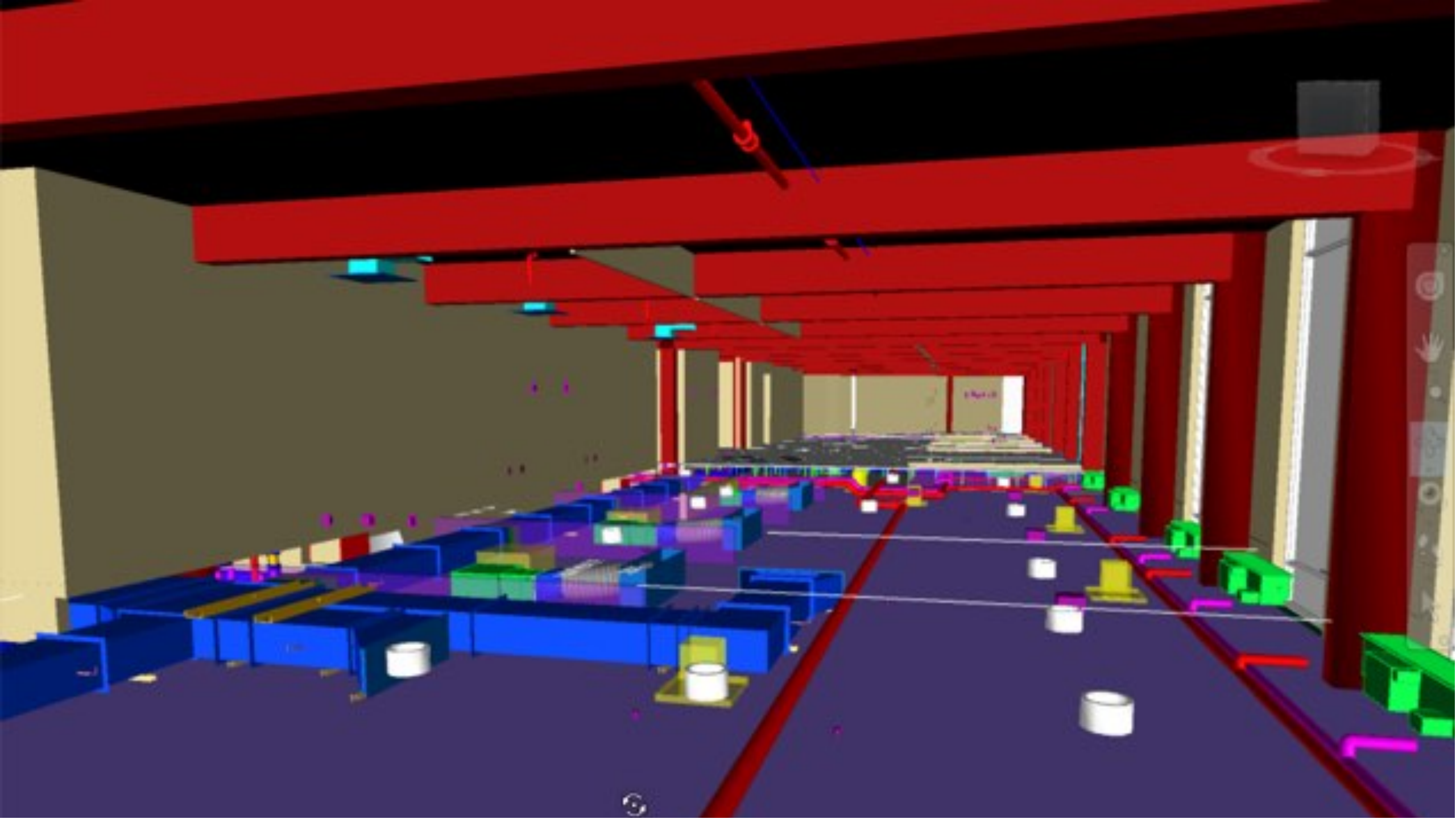
- Coordination is occurring 3-6 months earlier in the project than conventional practice. This is a big shift.
- All factory penetrations must be finalized during the shop drawings process.



MEPF Coordination for Prefabrication

A photograph showing the interior of a building under construction. The ceiling is made of light-colored wood panels. A network of white pipes and conduits is installed, running horizontally and vertically. A vertical pipe is connected to a horizontal pipe, and another pipe branches off at an angle. The pipes are secured with metal brackets and bolts. A black metal beam is visible below the pipes.

MEPF model sign off procedure needs to be completed with a finish to finish relationship with mass timber shop drawing review, assuming “as late as possible”





RFI Process



RFIs Take Time

- Types of RFIs Include:
 - Geometry Based Questions
 - Discrepancies between Structural and Architectural
 - Fire Related RFIs
 - Finishes Related RFIs

PROCUREMENT

How long will it take for materials to arrive on site?

Procurement Schedule



Apr 1 - Sep 22



Procurement

Apr 1 - May 15



Single Piece Shop Drawings

May 18 - Aug 28



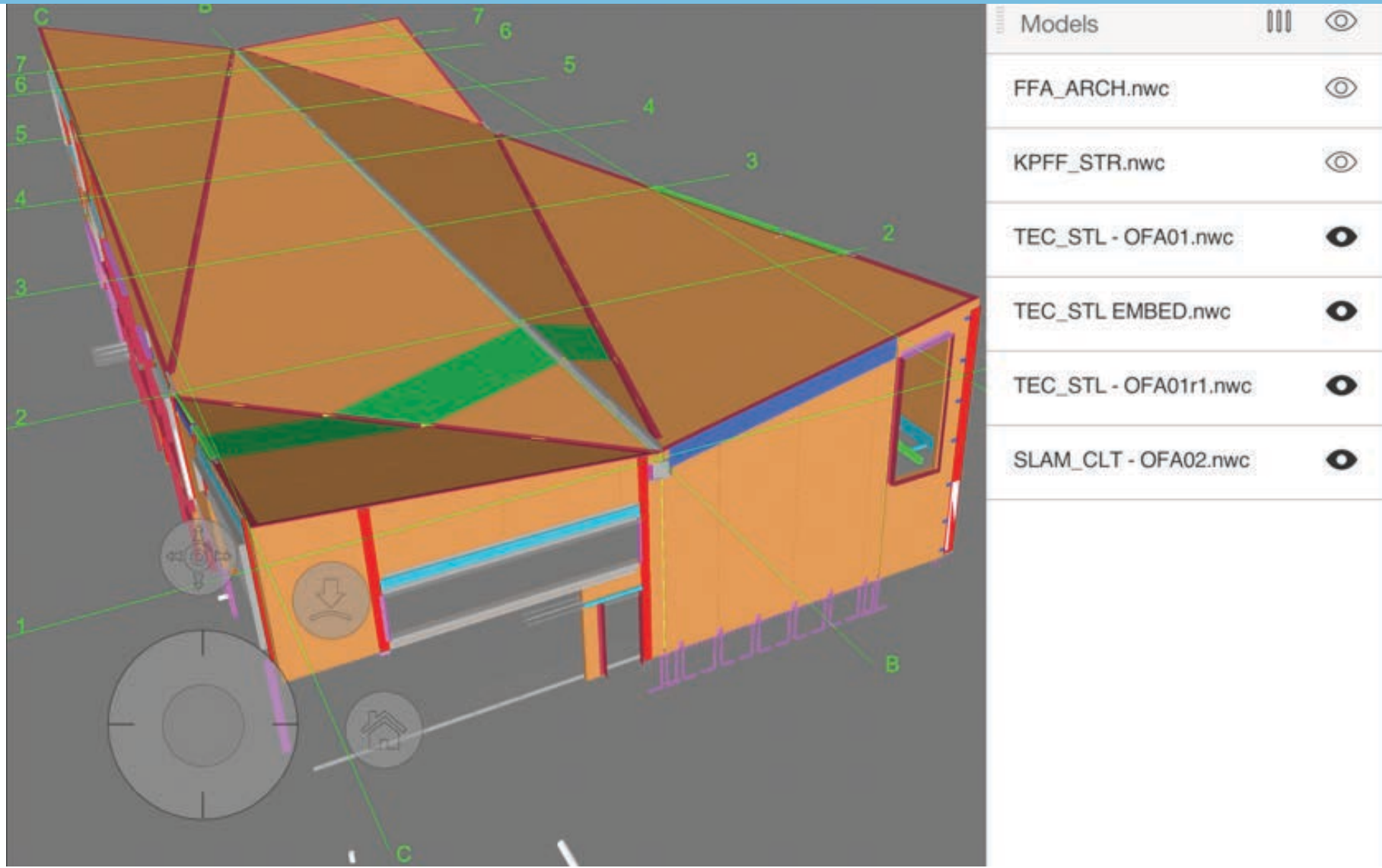
Manufacturing and Fabrication

Jul 20 - Sep 22

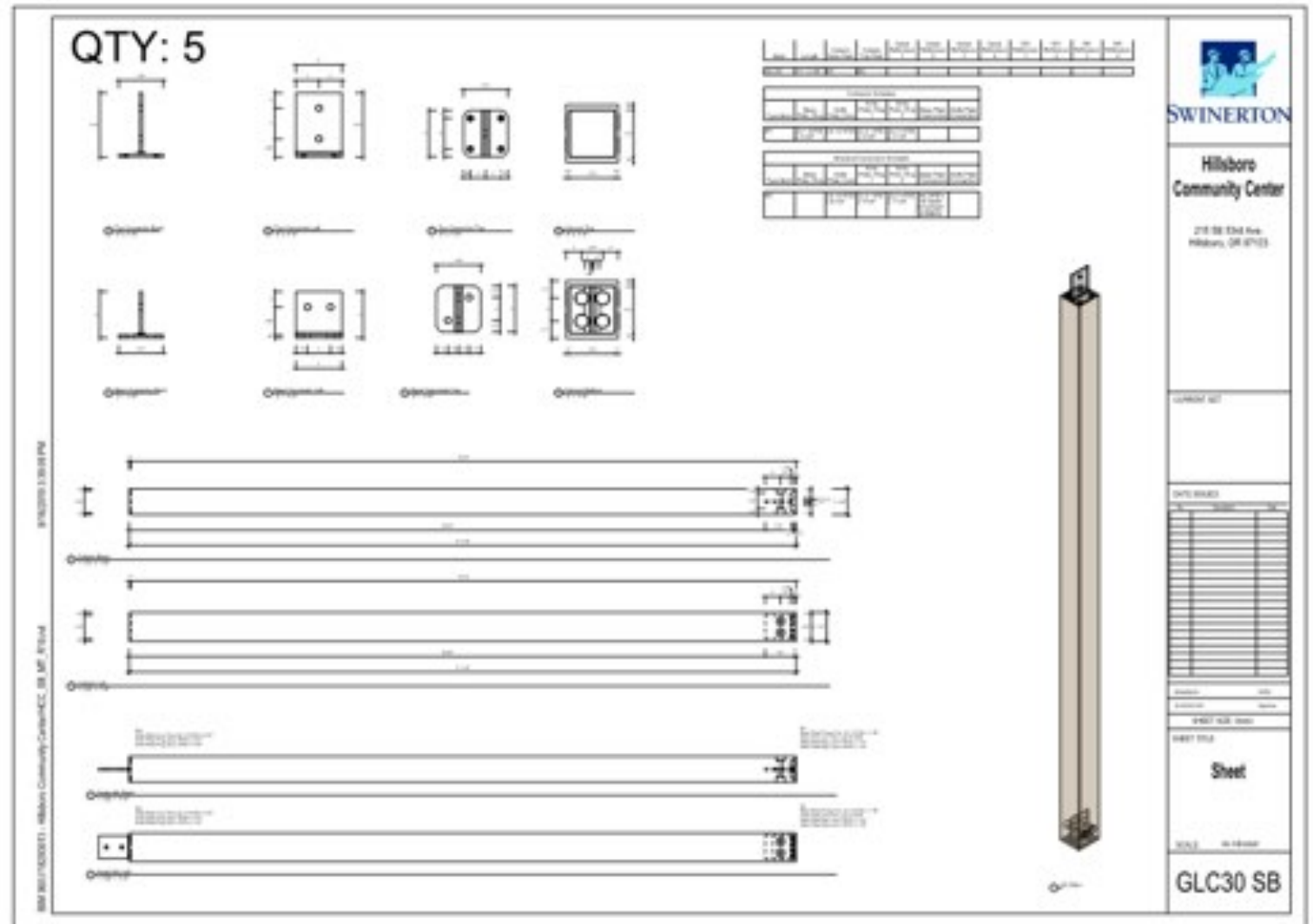


Delivery to Staging Area

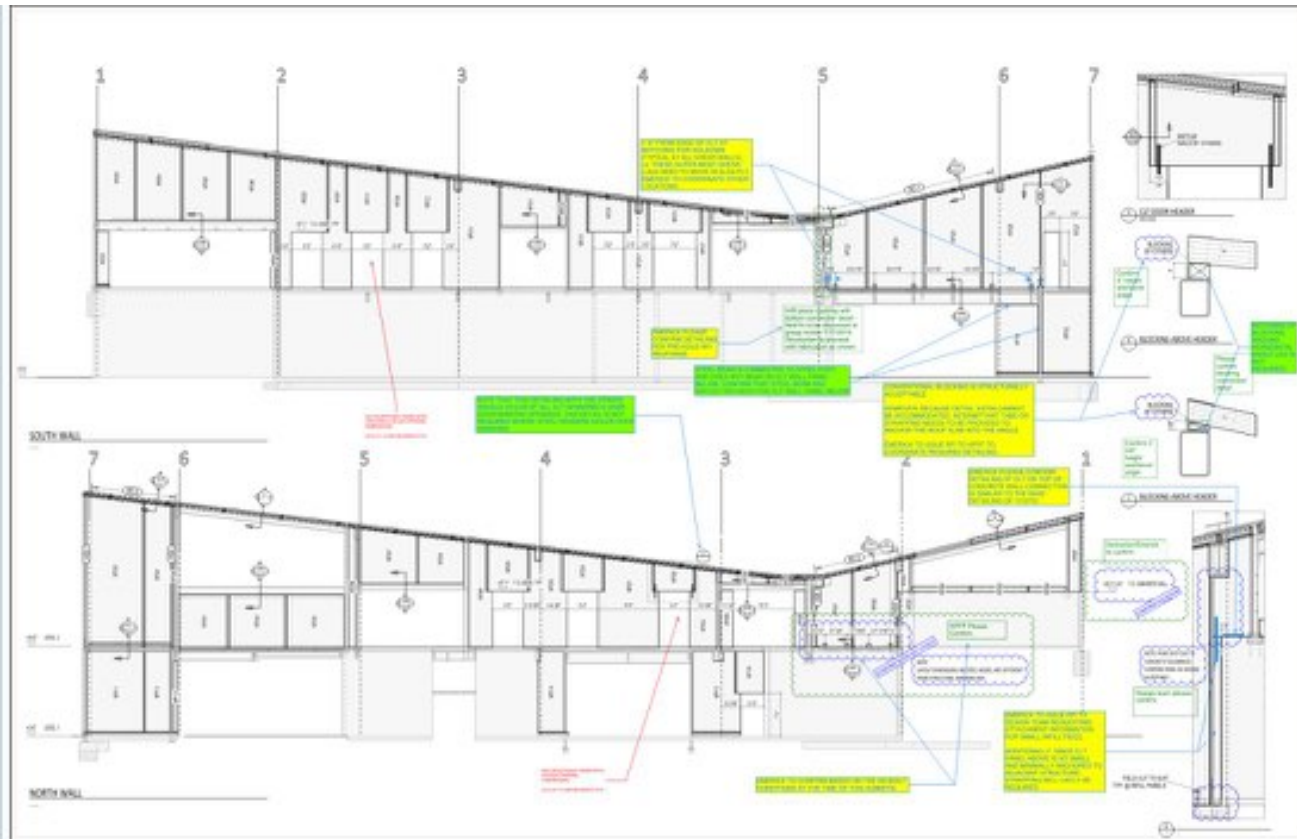
Fabrication-Level Models



Single Piece Detailing



Shop Drawing Review



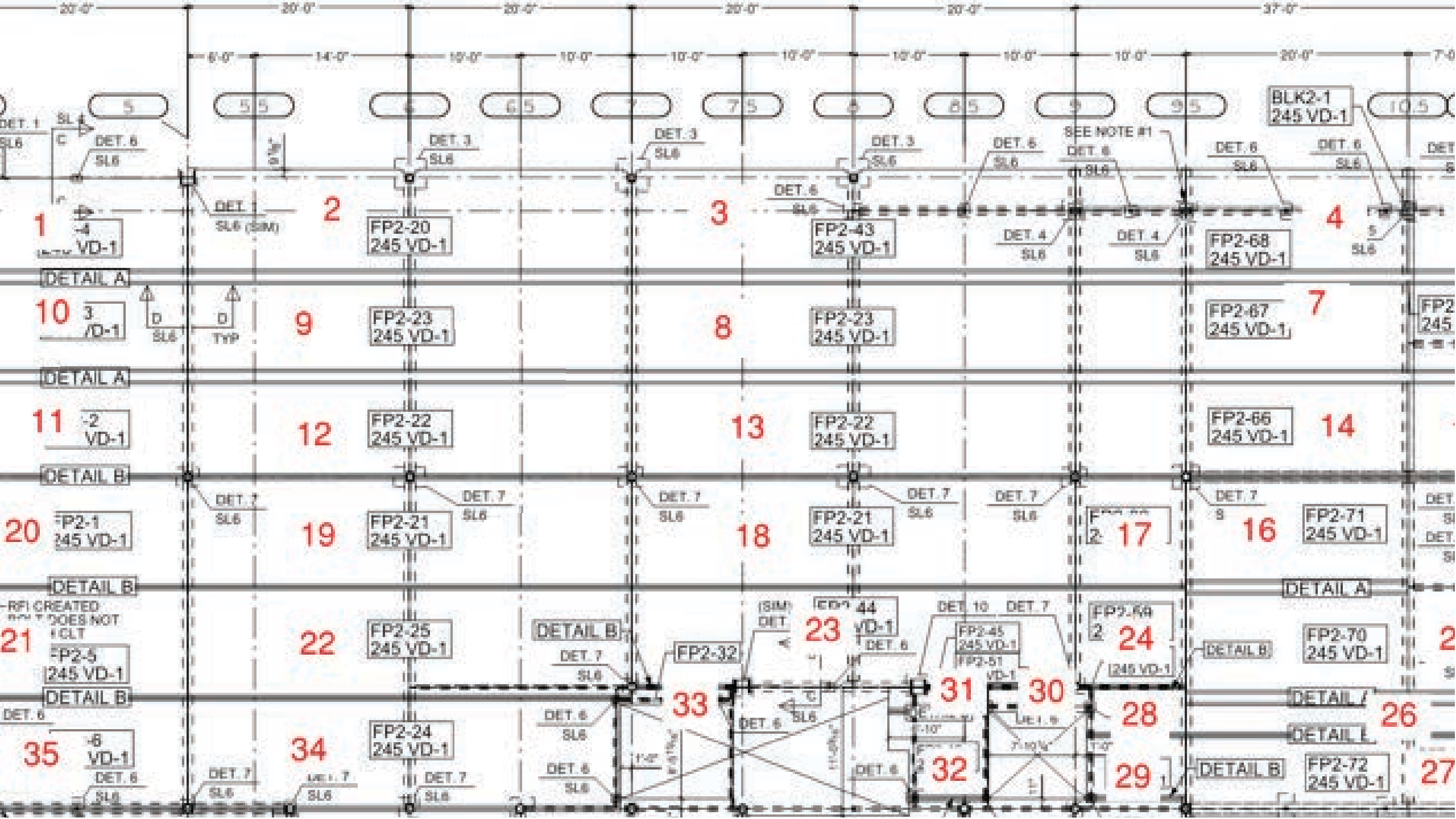
Review

- AEC team should plan for a big push to get through shop drawing review
- Lingering questions from shop drawing review could drag on for weeks or months if not addressed definitively

Project Phasing & Sequencing

- Reconcile truck loading with construction sequence to reduce time for intermittent handling
- Consider project phasing for large floor-plate (25,000+ SF) buildings





Material Lead Time

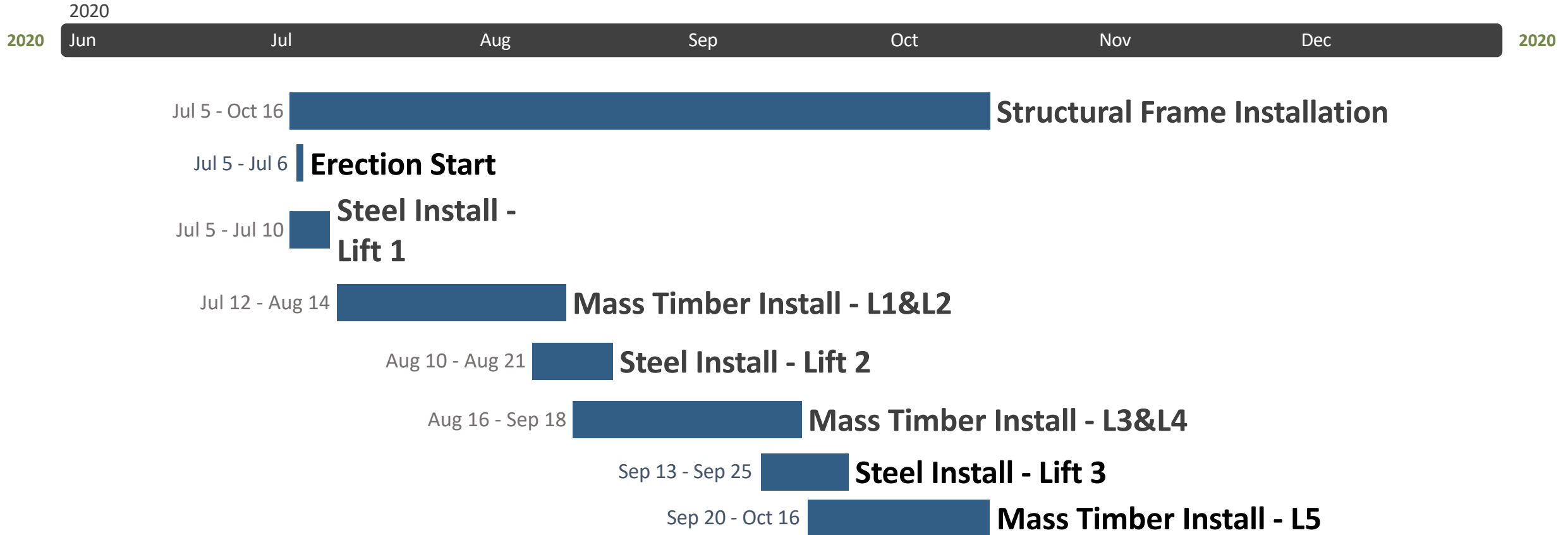


- For small (<50,000 SF) projects, RFI and shop drawing process consumes the bulk of material lead time.
- For large (>100,000 SF) projects, production duration begins to exceed shop drawing duration.
- Material Lead Time is a function of how developed and detailed the drawings are
- Larger projects must be procured earlier, especially if there are production constraints. Plan to stockpile material.

CONSTRUCTION

How fast can we build?

Construction Schedule



Off-Site Storage



Temporary local storage and
local delivery of materials

Proper protection of material

Proper documentation of
material hand-off via BIM 360
Field Checklists

Truck Flow

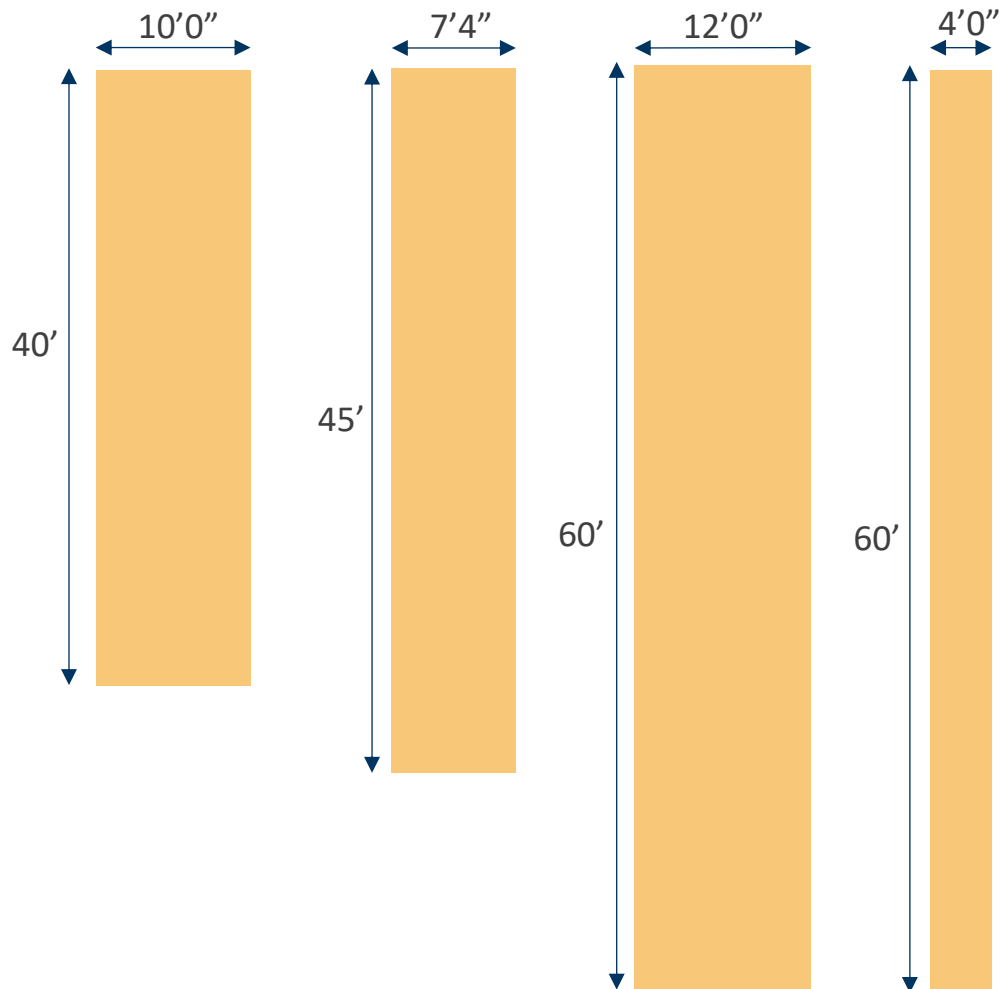
Logistics, laydown space, truck flow is critical to speed of installation.

Tight sites and a lack of access to the crane dramatically decreases workflow and increases crew size.

Space for crane and at minimum 1 truck in swing radius is needed.



Piece Count



Productivity is based on piece count

More pieces = Longer Install Duration

Different suppliers manufacture panels of different lengths

A job may have 80 CLT panels with Supplier X, and 140 CLT panels with Supplier Y.

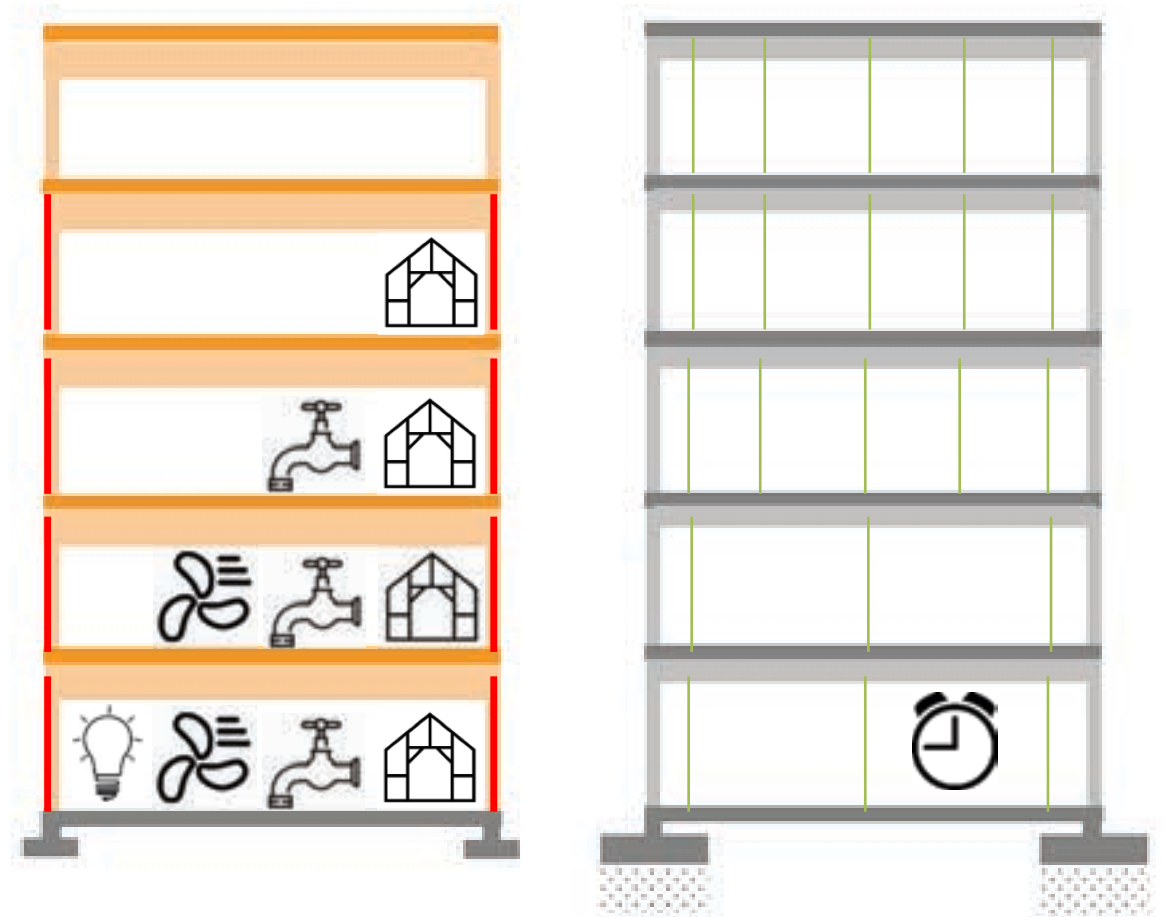
Lateral System Construction

Advancing of permanent lateral system to stabilize frame as soon as possible and shorten duration of temporary bracing



Early Move-In for Follow-On Trades

- Prepare follow-on trades to take advantage of swift structure installation



Roof Installation



Install roof as quickly as possible

> QUESTIONS?

This concludes The American Institute
of Architects Continuing Education
Systems Course

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