ASPECT

STRUCTURAL ENGINEERS

TALL MASS TIMBER

TEAMWORK MAKES THE DREAM WORK

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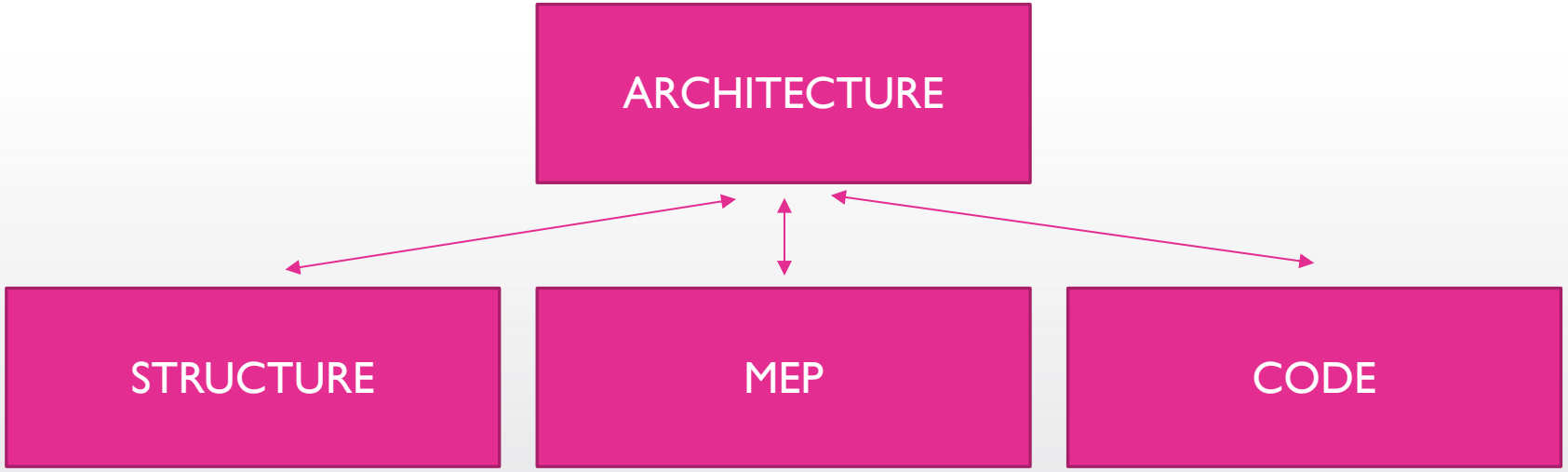
TALL MASS TIMBER

TEAMWORK MAKES THE DREAM WORK

- Rethink project organization + teams
- Schematic design considerations
- Collaboration with the suppliers and builders
- Seismic Considerations
- Codes

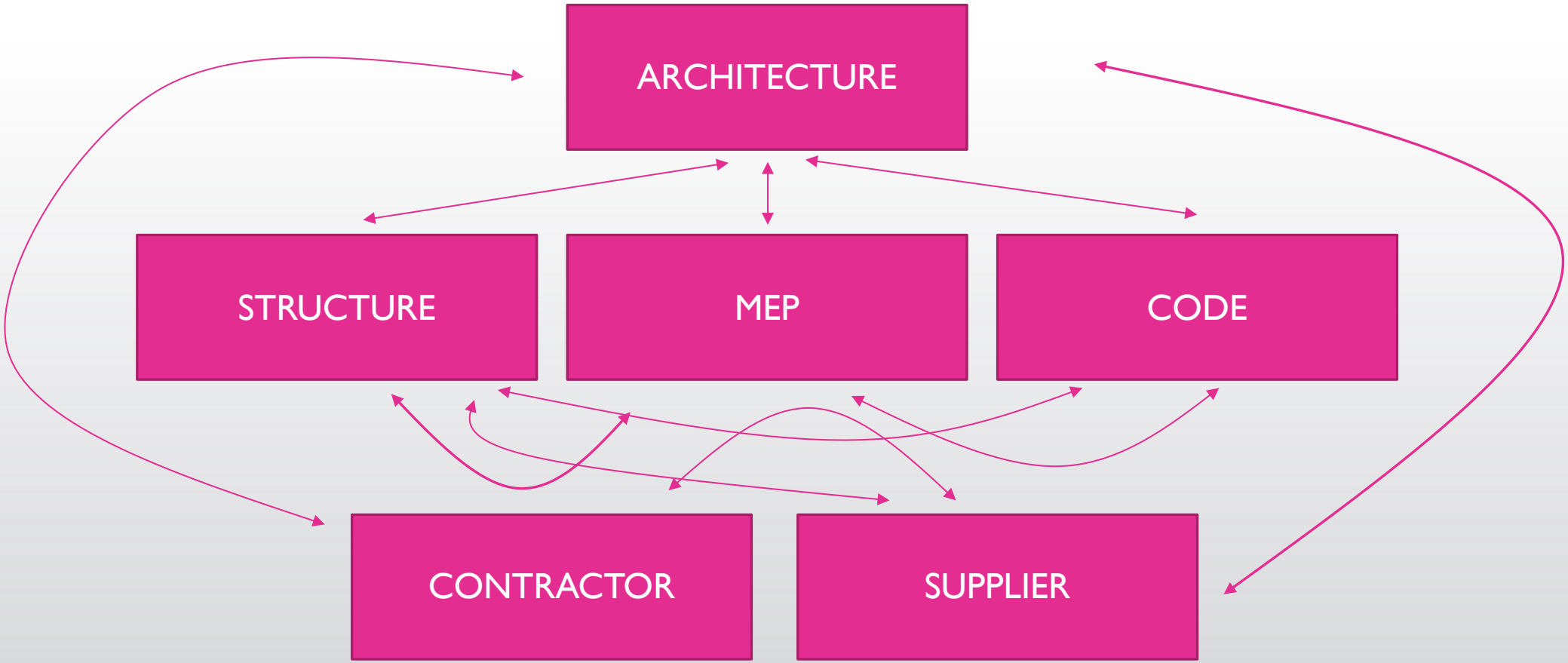
TRADITIONAL

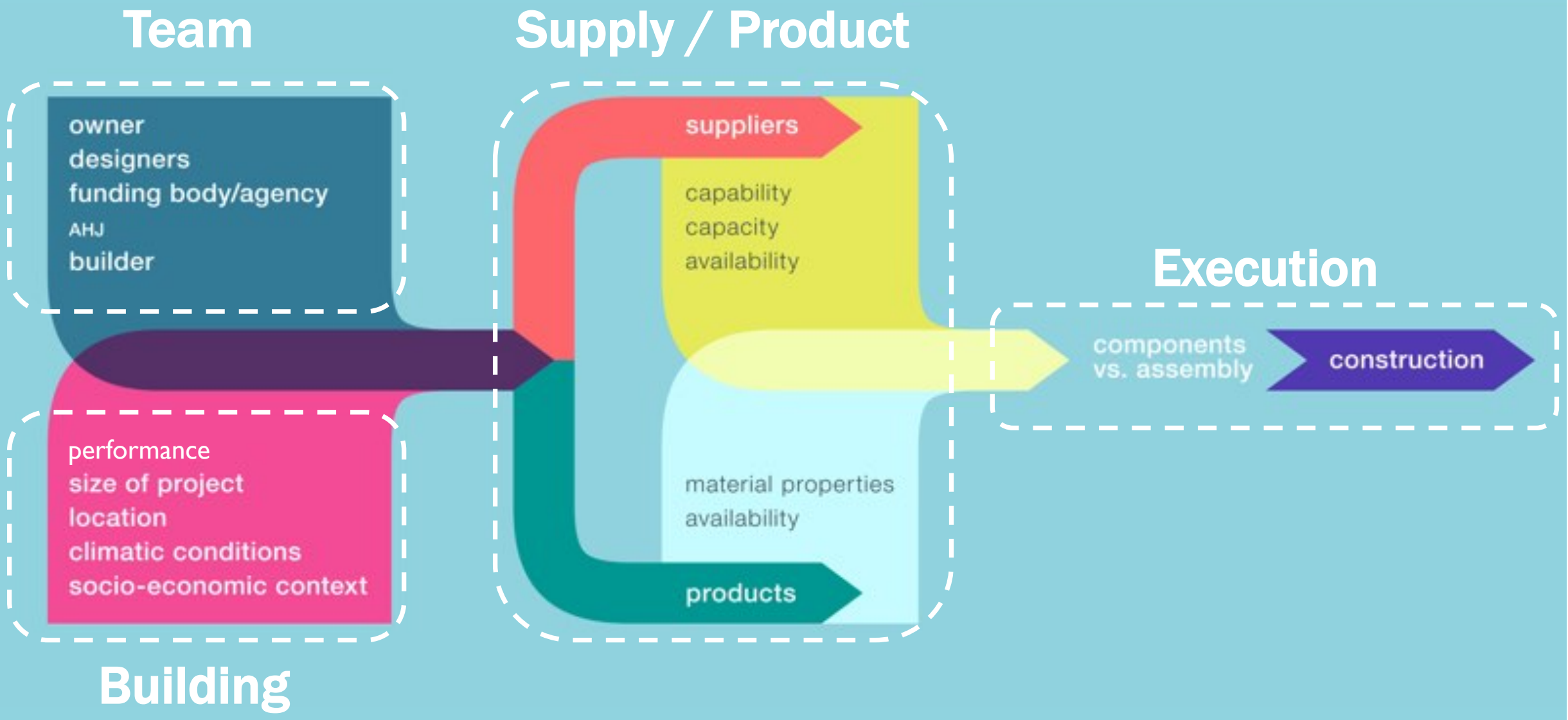
DESIGN



CONSTRUCTION

TALLWOOD

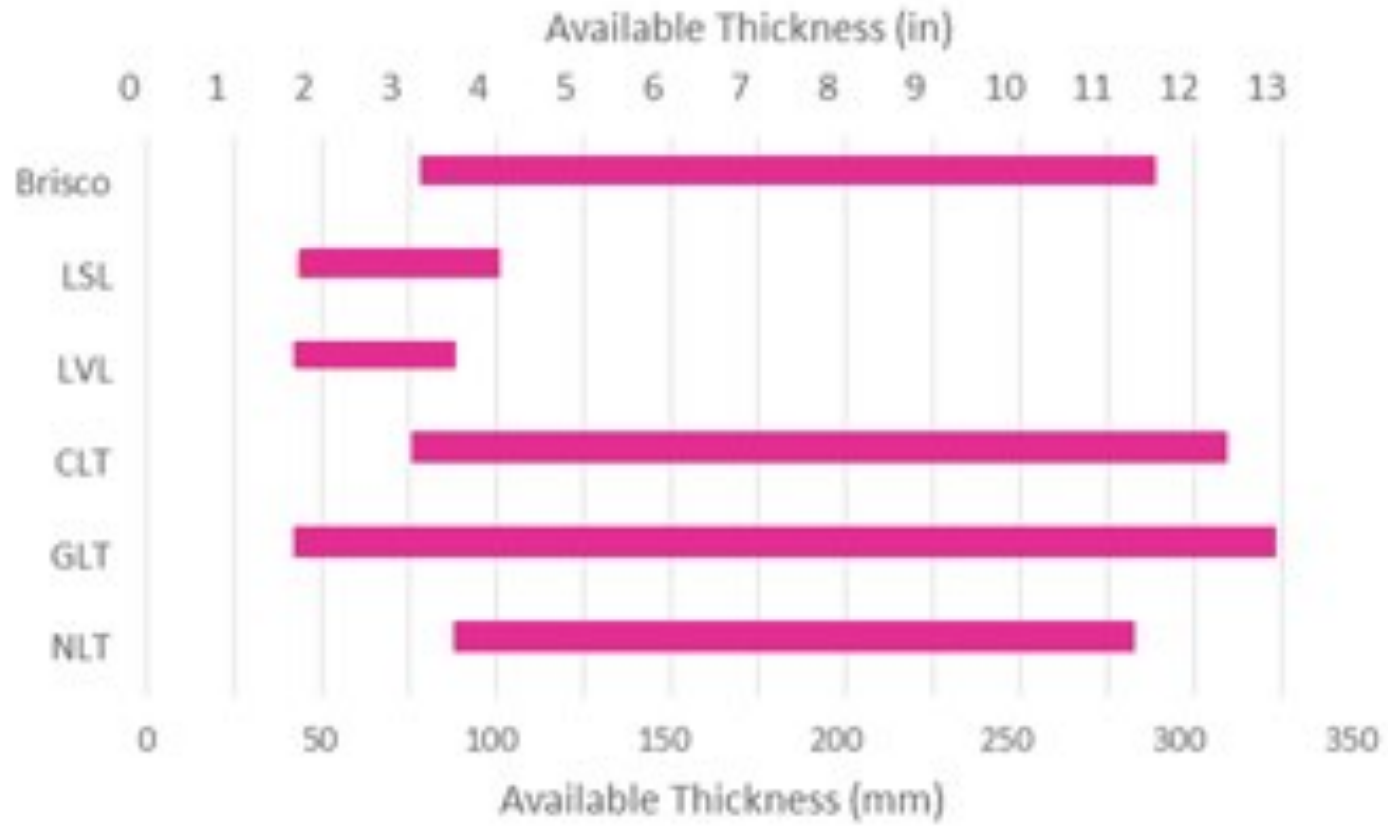



Team
owner
designers
funding body/agency
AHJ
builder
Supply / Product
suppliers
capability
capacity
availability
material properties
availability
products
Execution
components
vs. assembly
construction
performance
size of project
location
climatic conditions
socio-economic context
Building

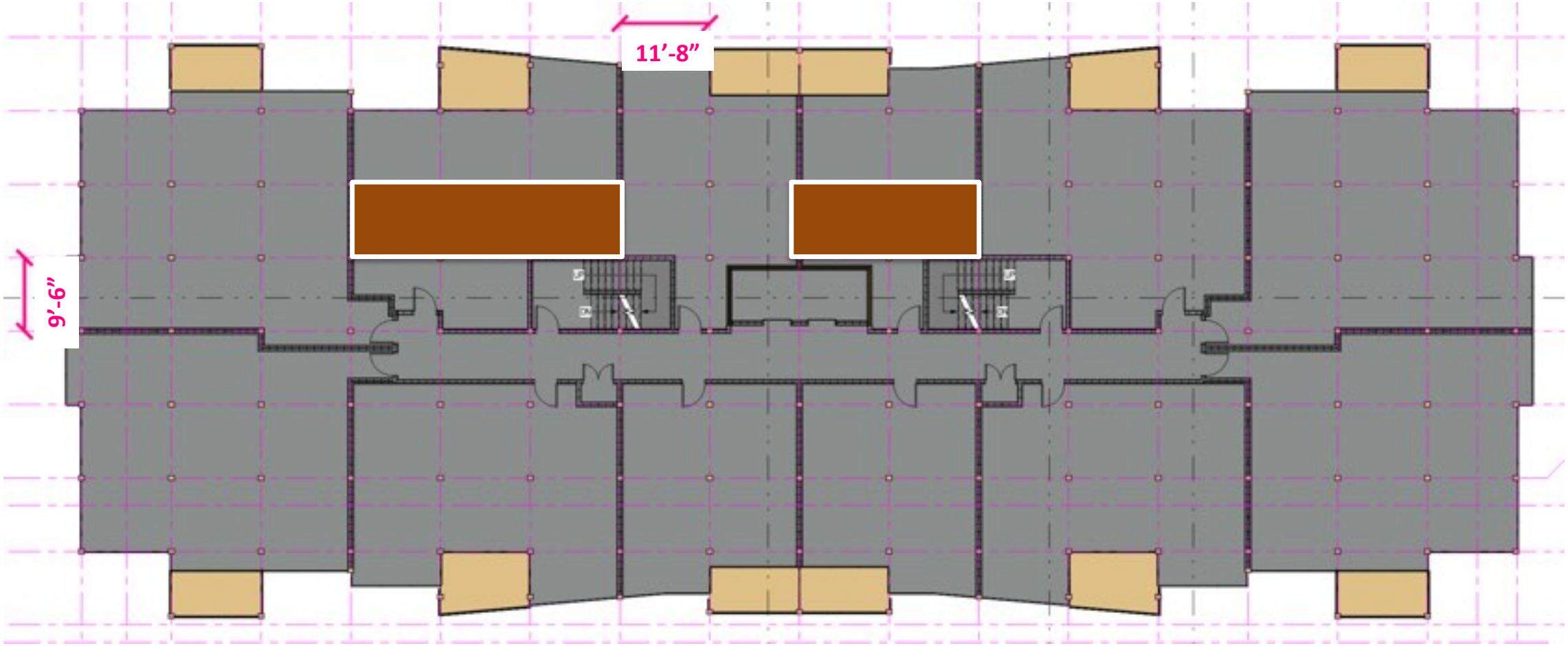
SCHEMATIC DESIGN CONSIDERATIONS

Different Materials
Different Tolerances
Different Markets

Sizes Available

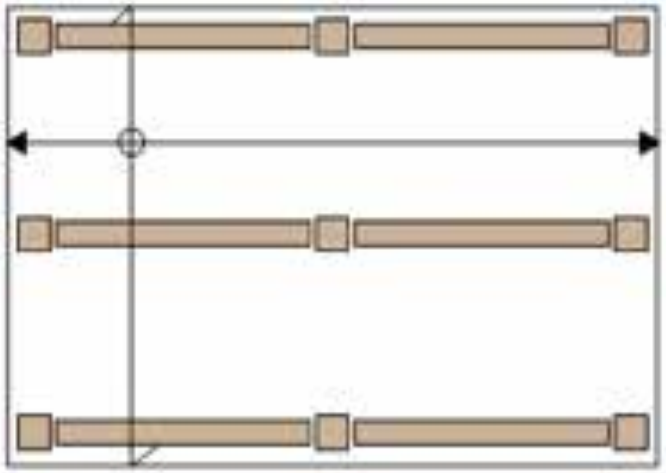


Gridlines need to match panel availability!

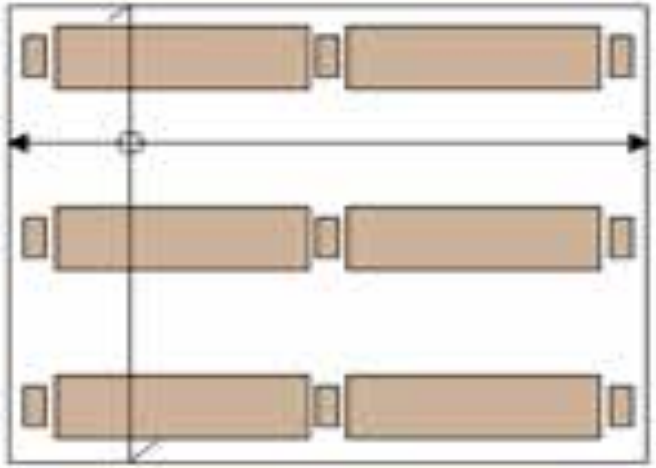


Floor types

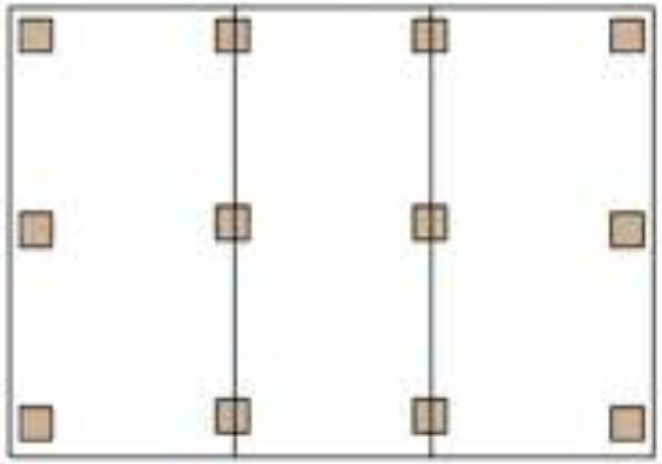
Post and Beam
Efficient for:
Beam spans up to 30’
Slab spans up to 20’



Post and Slab Band
Efficient for:
Beam spans up to 20’
(longer if composite)



Flat Slab
Efficient for:
Column spacing up to 12’



Column spacing decreases →

Structure depth decreases →

Modern Connections

Modern Connections

COLLABORATION WITH SUPPLIERS AND BUILDERS

Design for Manufacturing

Design for Transportation

Design for Installation

SEISMIC CONSIDERATIONS

ASCE 7-16

- **No addition of mass timber lateral system into table 12.2-1**

Options

- Concrete cores
- CLT walls
- Braced Frames

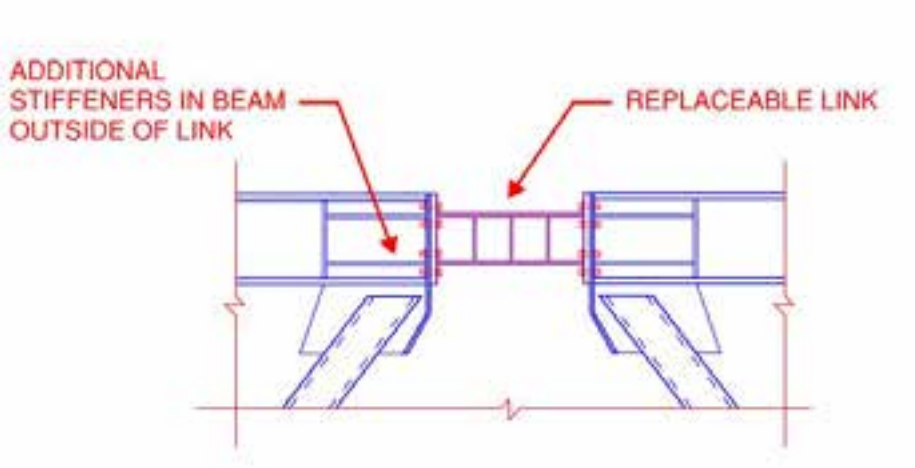
Options

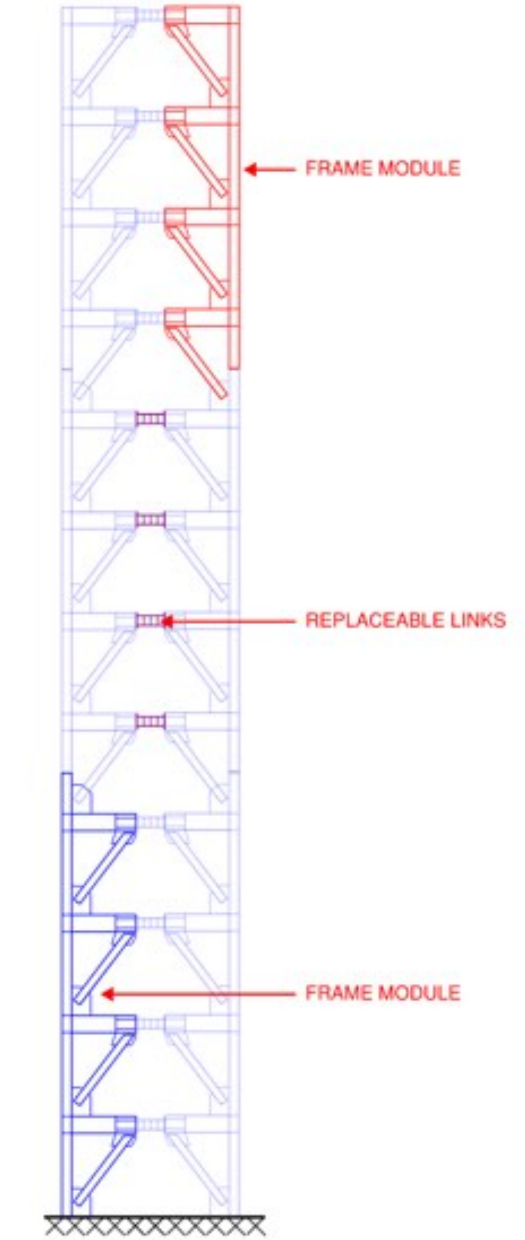
- Concrete cores
- ~~CLT walls~~ (Usually)
- Braced Frames

CONCRETE CORES

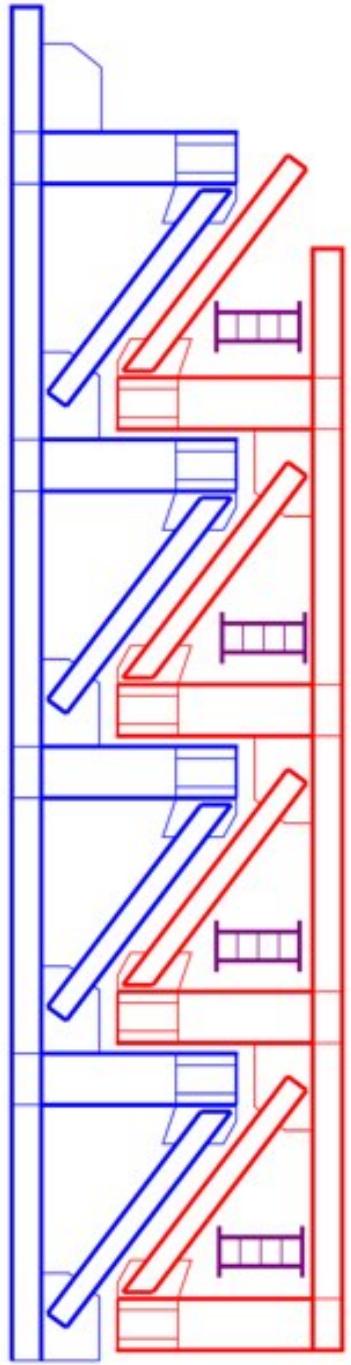
BRACED FRAMES

STEEL EBFS





Modular Eccentrically Braced Frame



	Concrete Core	CLT shear walls	BRBs or Eccentrically Braced Frames
Cost			
Time			
Quality / Prefab			
Code			
Ductility			

Diaphragms

- Concrete topping
- Untopped CLT
- Rigid / Flexible assumptions

Transfer at Podium

- These buildings are NOT light frame where transfers are common
- Transferring the lateral system is costly and inefficient
  - Uneven distribution of lateral loads
  - Deep transfer beams

TALLER WOOD CONSIDERATIONS

Vibration due to wind

- Lightweight building with low damping → vibration challenge
- Added damping might be necessary at taller heights

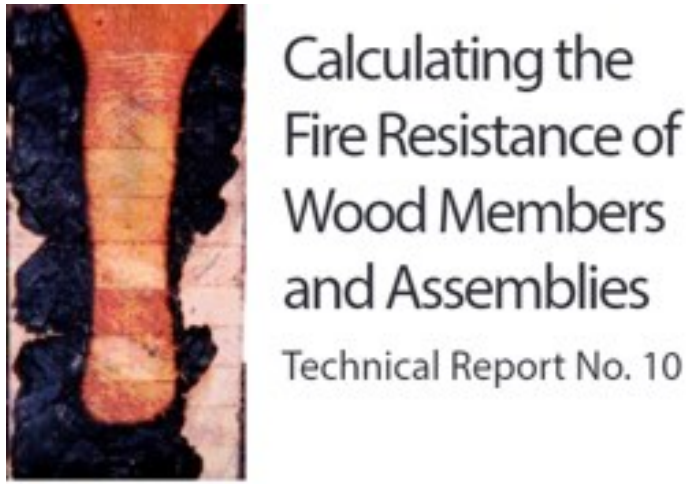
Shrinkage and Creep

- Consider interface between wood + lateral system
- Short term: elastic shortening while building is loaded
- Long term: creep and shrinkage

FIRE AND STRUCTURE

Fire

- Structural consideration of fire
  - ASCE 7-16 Appendix E: Performance-based fire design
  - NDS Chapter 16 – fire design of wood members
  - AWC Technical Report 10 – expansion and examples



QUESTIONS?

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