



Mid-Atlantic  
TIMBERFRAMES

# WHY HEAVY TIMBER IS THE FUTURE OF DESIGN AND CONSTRUCTION

The Evolution of a Proven  
Building Method

# Program Registration

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# Learning Objectives

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Upon completion of this course the student will be able to:

- 1 **Discuss** the history and evolution of heavy timber framing as a sustainable building method.
- 2 **Identify** the modern benefits of designing and building with heavy timber such as biophilia, sustainability, value, embodied carbon, thermal performance, structural performance, and fire resistance.
- 3 **Describe** the process of heavy timber framing including designing with assistance from the heavy timber company, engineering, and construction perspectives for both residential and commercial applications.
- 4 **Identify** timber-related technology, automation, and the future of the heavy timber industry.
- 5 **Discuss** several projects where heavy timber satisfied program needs for aesthetics, engineering capabilities, sustainability, and other factors.

## Course Overview

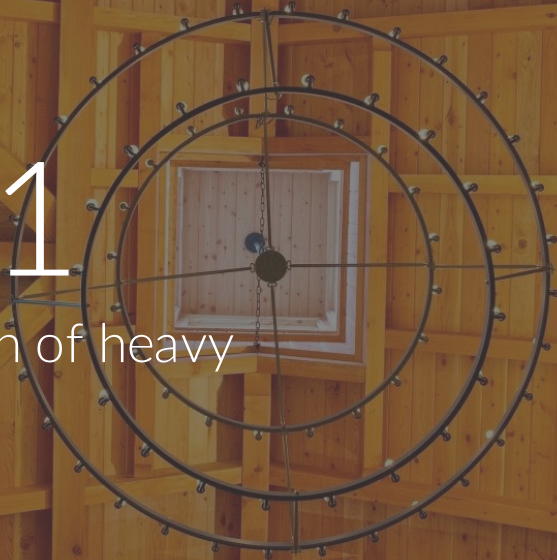
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This course will explore the evolution of heavy timber structures, tracing their history from more than a millennium ago through their emerging popularity in recent decades. Participants will gain insight into how traditional timber framing methods have been revitalized and integrated with modern, state-of-the-art production techniques in controlled environments.



# Section 1

The history and evolution of heavy  
timber framing

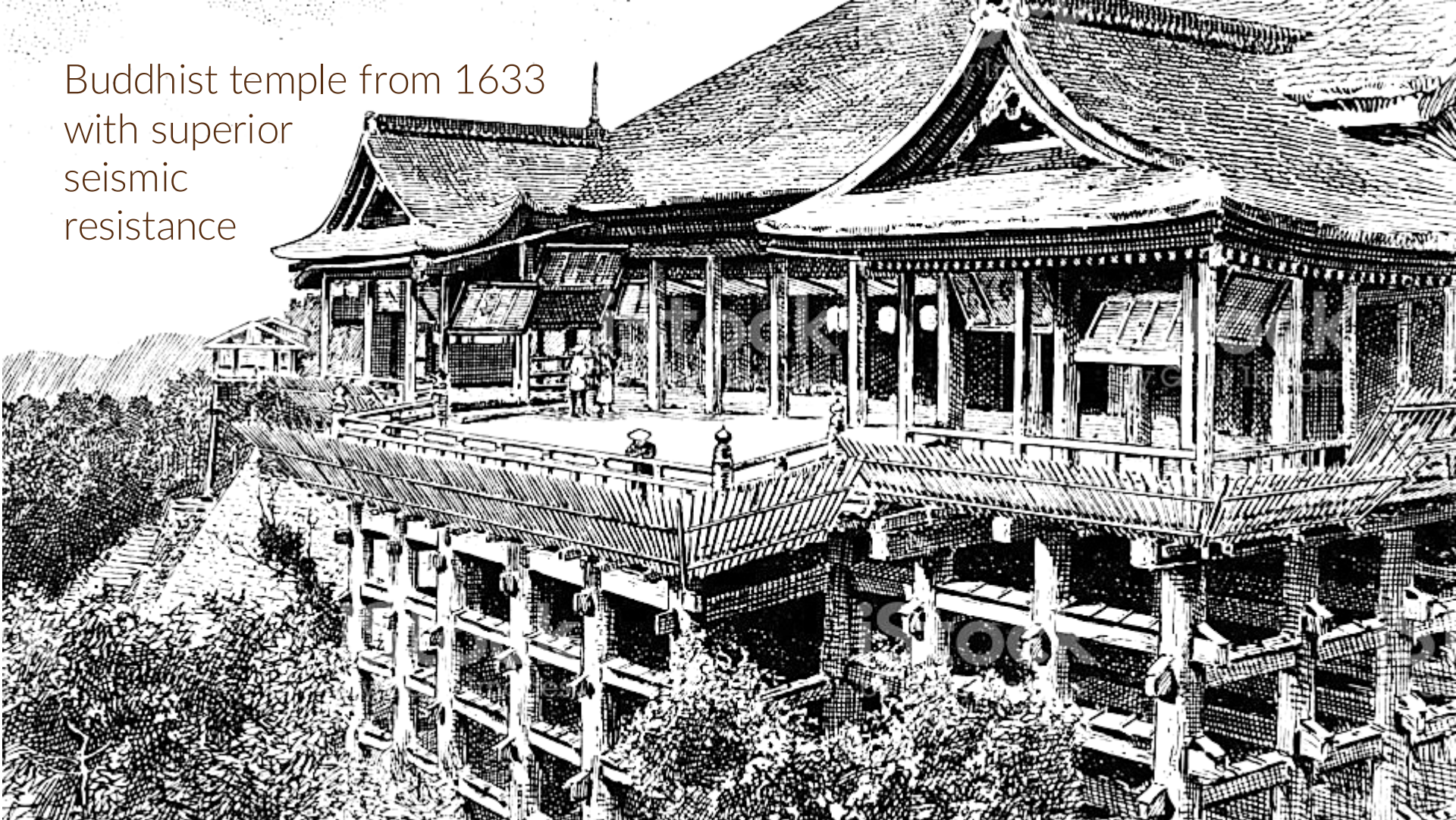




## Heavy Timber Framing Through the Ages

- Evidence of timber framing dates to the Stone Age
- Oldest wooden building dates to 700 A.D.
- Horyuji Temple in Japan is 1,300 years old

Buddhist temple from 1633  
with superior  
seismic  
resistance





Westminster Hall in England built  
1907

- Timber framed structure that was erected by King William II
- Hall has been in continuous use for more than 1,000 years

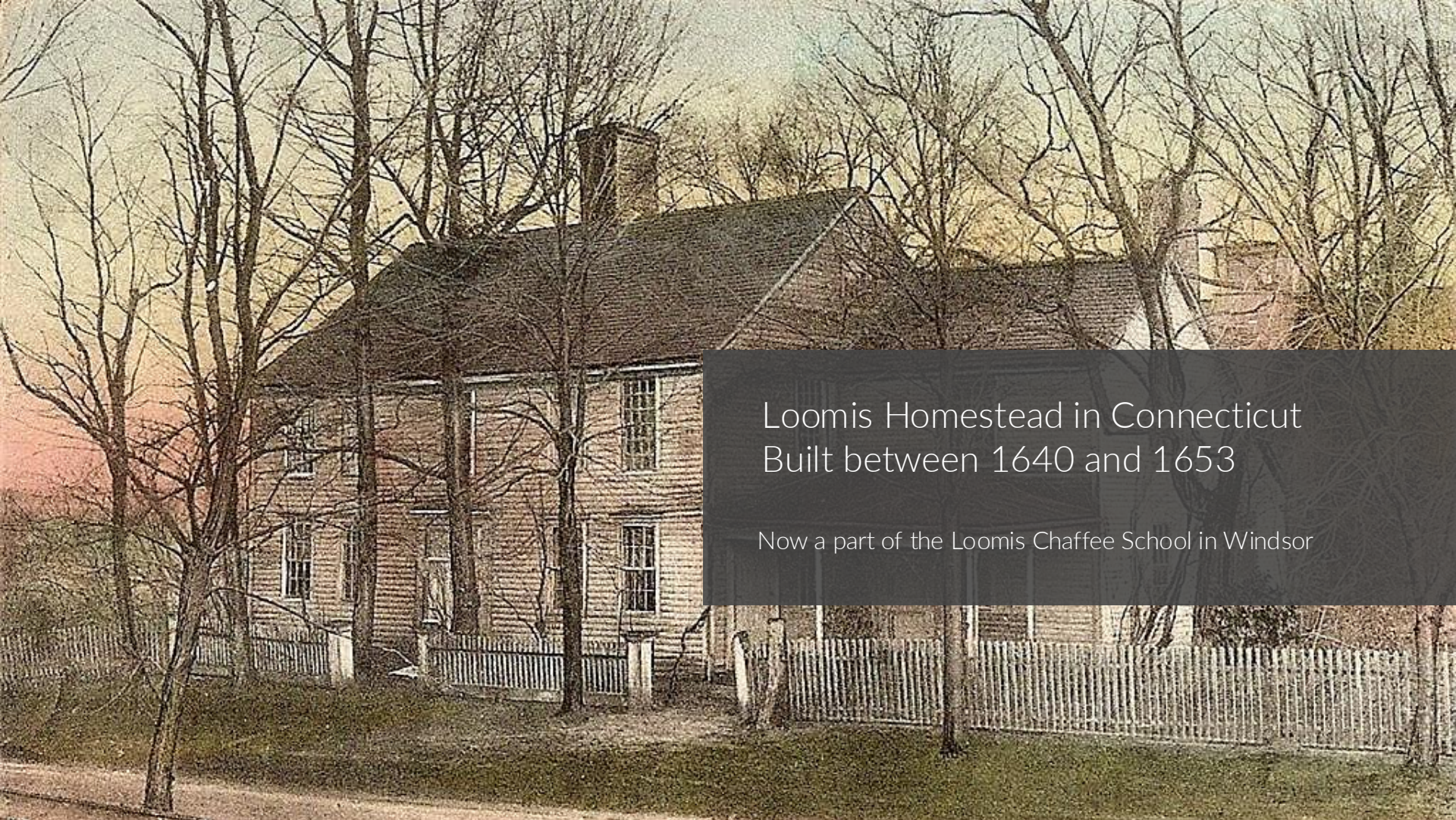


# The Fairbanks House in Massachusetts built in 1641

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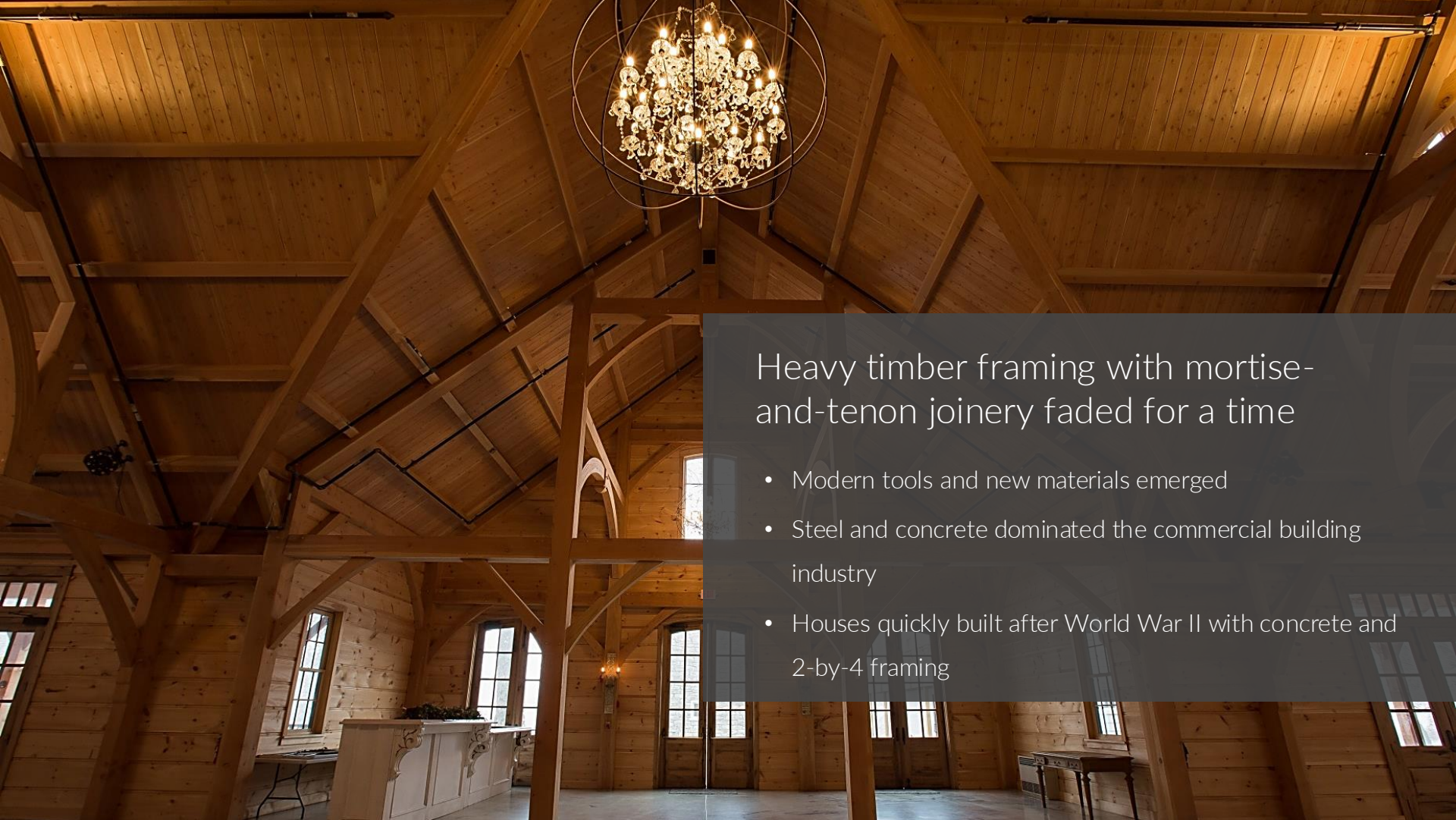
- The oldest surviving timber-frame house in North America
- Constructed by Puritan settler Jonathan Fairbanks





Loomis Homestead in Connecticut  
Built between 1640 and 1653

Now a part of the Loomis Chaffee School in Windsor



## Heavy timber framing with mortise-and-tenon joinery faded for a time

- Modern tools and new materials emerged
- Steel and concrete dominated the commercial building industry
- Houses quickly built after World War II with concrete and 2-by-4 framing



Heavy timber rose up again in the 1970s and 1980s

- Reaction to cookie-cutter homes
- Reaction to environmental costs of concrete and steel
- Awareness that wood is only renewable structural building material

# Section 2

Timber framing terms: Heavy timber  
and mass timber

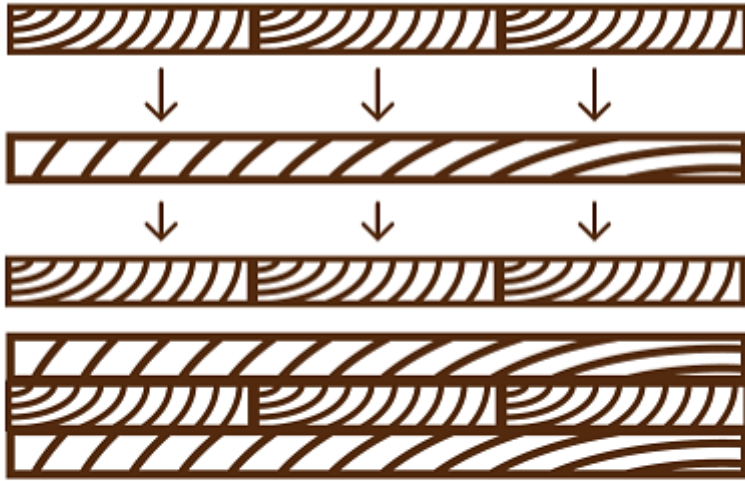




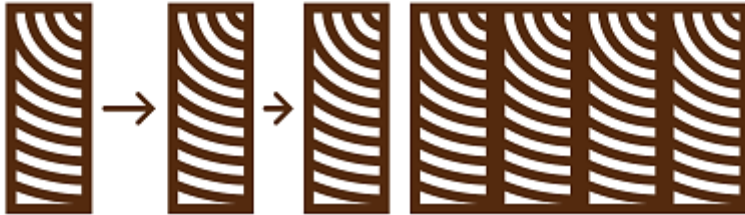
## What is heavy timber?

- In past used mainly for:
  - Agricultural buildings
  - Residential properties
- Today also popular for:
  - Schools
  - Universities
  - Churches
  - Municipal buildings
  - Commercial buildings

## Cross-Laminated Timber



## Glued Laminated Timber



## What is mass timber?

- A different class of wood products
- Known as EWPs (engineered wood products)
- Combine wood's inherent strength with modern engineering





## Cross-laminated timber (CLT)

- A panelized EWP
- Used for floors, walls, and roofs
- Three or more layers of lumber
- Each layer oriented perpendicularly to the adjacent layer
- Layers pressed together with adhesive



The image shows the interior of a building with a vaulted ceiling and columns made of Glulam wood. The wood is light-colored with a natural grain. The ceiling is composed of horizontal planks that meet at a central point, creating a triangular shape. The columns are also made of wood and support the ceiling. A large window with a dark frame is visible in the foreground. The overall atmosphere is warm and modern.

## Glulam

- Individual wood laminations bonded together
- Extremely strong and stiff
- Often used for columns and beams
- Can be used alone or as part of a hybrid system



## Mass timber ideal for large projects

- Quote: “Mass timber construction is strong, durable, and energy efficient, helping architects and specifiers create completely custom structures that help them leave their unique design footprint.”
- Sam Ebersol, General Manager, Mid-Atlantic Timberframes

# Case Study: Mass timber creates warmth in a commercial building

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# Case Study: Mass timber creates warmth in a commercial building

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# Case Study: Mass timber creates warmth in a commercial building

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# Section 3

The benefits of heavy timber and mass timber construction





## Benefits of timber construction have evolved as societies have evolved

- For early humans, the best way to create shelter
- Later was a way to create large barns and open buildings
- In 1970s, it was a return to craftsmanship
- Today, the benefits have grown exponentially

Aesthetics and biophilia



Design flexibility



Sound dampening capacity

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Resiliency



# Sustainability and embodied carbon



Energy efficiency



Reduced material use



Project efficiency



# Fire resistance and structural integrity

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# Case Study: Timber framing creates a nature-themed retreat in West Virginia

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# Case Study: Timber framing creates a nature-themed retreat in West Virginia

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# Section 4

How the heavy timber process works



Process starts with a heavy timber construction expert





## Heavy timber designer involved from the beginning

- Works with:
  - Architect
  - Structural engineer of record
  - Client

Craft

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Build



# Section 5

Questions and Answers: The most commonly asked questions about heavy timber



# Q: What wood species is most recommended for timber framing?

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- Most common is Douglas fir for solid sawn heavy timber
- Only tree in North America that grows large enough for FOHC
- Most reliable for strength
- Glulam timbers don't require FOHC wood



## Q: Are kiln-dried timbers recommended?

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- Kiln dried timbers are more preferable because it creates less shrinkage
- Creates a more stable material
- The majority of heavy timber is kiln-dried



# Q: What is preferable for timber framing: glulam timbers or solid sawn timbers?

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- Depends on spans and desired aesthetic
- Solid-sawn timbers have span limitations
- Glulam timbers are more versatile



Q: How are the engineering responsibilities distributed for heavy timber buildings?

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## Q: What factors affect the cost of a timber frame building?

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- Site access
- Materials specified
- Clear spans
- Loading
- Conventional or hybrid



The image shows the interior of a large wooden structure, likely a dome or a vaulted ceiling, constructed from light-colored timber. The structure is composed of numerous wooden beams and trusses that form a complex, radial pattern. In the center, a circular metal frame with several concentric rings and radial spokes is suspended from the ceiling. The frame appears to be a technical or scientific instrument, possibly a spectrometer or a similar device. The lighting is warm and even, highlighting the natural grain and texture of the wood.

# Section 6

The future of the heavy timber industry



An old-world building technique evolved into a state-of-the art building method

- Biophilia
- Durability
- Sustainability

Pre-fabrication with off-site manufacturing



3D modeling

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# CNC technology and hand tooling

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Commercial heavy timber  
in an era of supply chain  
disruptions

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# Section 7

Gallery: Examples of modern timber  
frame buildings



Mendham, New Jersey



Towson, Maryland

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Centreville, Maryland



Delray, West Virginia

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Chester County, Pennsylvania



Hockessin, Delaware

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St. Charles, Missouri

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Villanova, Pennsylvania



Mendham, New Jersey



Nappanee, Indiana

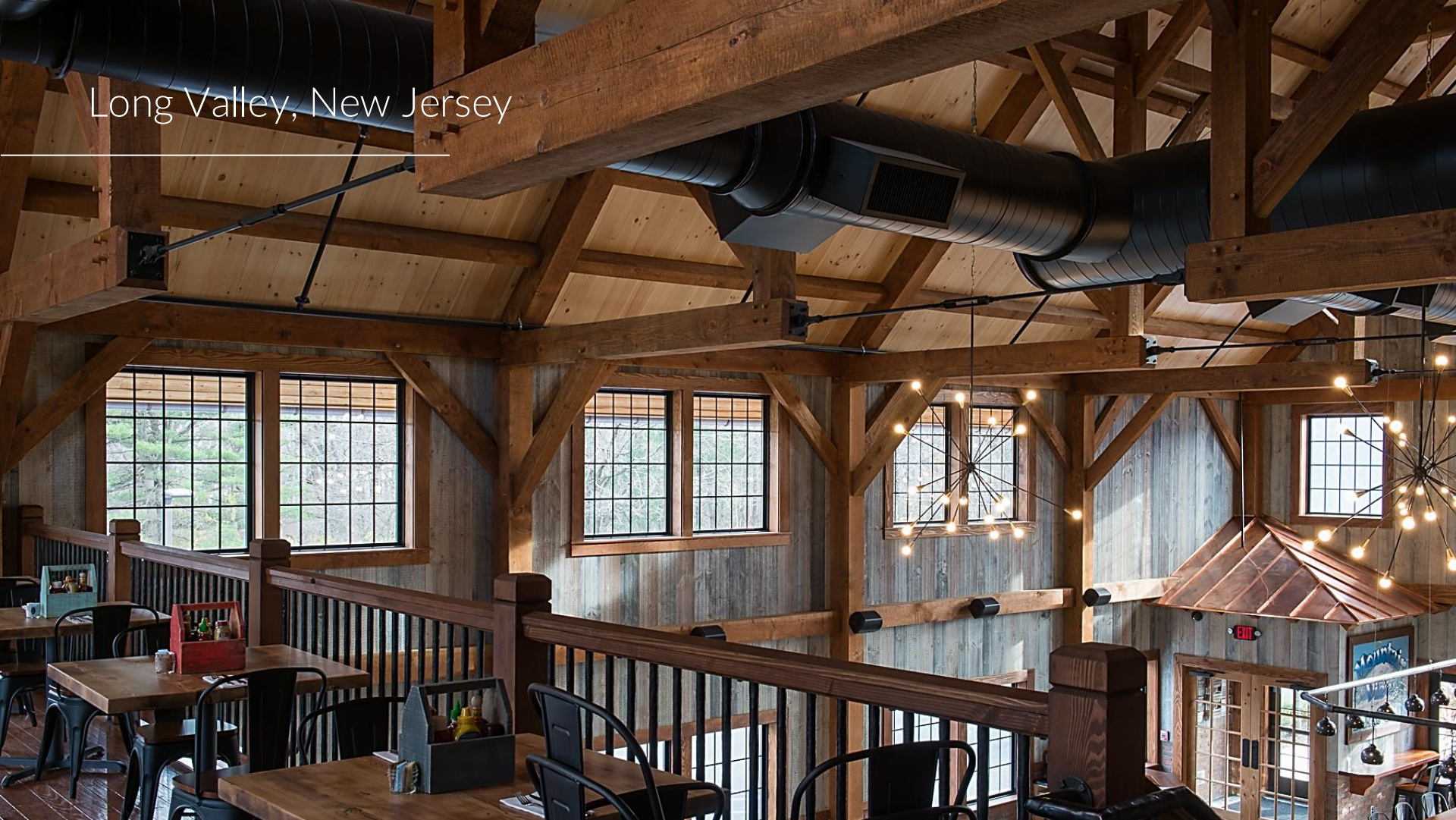
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Chestertown, Maryland



Long Valley, New Jersey



Mercersburg, Pennsylvania

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# Conclusion

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## Thank You

This concludes the continuing education unit on the **THE EVOLUTION OF A PROVEN BUILDING METHOD.**

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