QUALITY BUILDINGS

ARCHITECT MASS TIMBER PROCESS GUIDE & CHECKLIST

INTRODUCTION

Successful mass timber projects require integration of design vision with technical precision from day one. This guide combines our experience from dozens of mass timber projects to help you optimize your design process and avoid common pitfalls

DESIGNED TO HELP ANSWER KEY QUESTIONS IN THE MASS TIMBER PROCESS SUCH AS:

- Has the engineering team verified local code compliance for mass timber?
- What's the optimal structural grid to maximize timber efficiency?
- How will MEP systems integrate with the timber structure?
- Which connections should be exposed vs. concealed?
- What are the acoustic performance requirements between spaces?
- How will the building envelope interface with the mass timber elements?
- What level of prefabrication is possible for this project?
- Where are fabrication partners located and what are lead times?
- What are the site logistics for material delivery and storage?
- Have you identified the critical coordination points between trades?

Each of these questions shapes your design approach and can impact project efficiency and success.

HOW TO USE THIS DOCUMENT

- Follow the sections sequentially for new projects
- Use checklists to verify key decisions
- Reference compare metrics for client presentations

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GUIDE & CHECKLIST

PRE-DESIGN PHASE

OVERVIEW

Early decisions significantly impact project success. This section guides you through critical pre-design considerations that set the foundation for your mass timber project

KEY METRICS TO CONSIDER

1. Design development time savings: up to 25-30% with early engineering integration*
2. RFI reduction potential: up to a potential 40-50% compared to traditional construction **
3. Change order reduction: up to 35% through early planning

PRE-DESIGN ACTION ITEMS

1. Schedule engineering consultation & assemble team
2. Review local code requirements
3. Assess site conditions

PRE-DESIGN DETAILED CHECKLIST FOR REFERENCE

1. Code Analysis
   - Height and area limitations verified
   - Fire resistance requirements defined
   - Occupancy classification impacts reviewed
   - Local jurisdiction requirements confirmed
   - Alternative materials process identified
2. Site Evaluation
   - Climate considerations documented
   - Seismic requirements verified
   - Transportation access assessed
   - Storage space requirements defined
   - Crane access evaluated
3. Team Assembly
   - Mass timber consultant identified
   - Structural engineer with timber experience selected
   - Fire protection consultant engaged
   - Acoustic requirements determined

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DESIGN DEVELOPMENT PHASE

OVERVIEW

Optimize your design decisions for mass timber's unique characteristics while maintaining design intent.

DESIGN DEVELOPMENT CHECKLIST

1. Structural System
   - Column grid optimized for timber spans
   - Floor system type selected
   - Lateral system integration planned
   - Core design coordinated
   - Foundation requirements defined
2. Material Selection
   - Species selection criteria defined
   - Grade requirements specified
   - Moisture content limits established
   - Surface finish requirements detailed
   - Visual appearance criteria documented
3. Connection Design
   - Exposed vs. concealed decisions made
   - Standard connection types identified
   - Custom connection needs defined
   - Fire rating impact assessed
   - Acoustic considerations addressed

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GUIDE & CHECKLIST

TECHNICAL INTEGRATION PHASE

OVERVIEW

Successful technical integration requires careful coordination between systems and trades.

TECHNICAL INTEGRATION CHECKLIST

1. MEP Coordination
    - Service routing strategies defined
    - Penetration locations identified
    - Access requirements documented
    - Future maintenance considered
    - System integration detailed
2. Building Envelope
    - Weather protection strategy developed
    - Thermal performance requirements defined
    - Vapor control approach determined
    - Air barrier continuity planned
    - Interface details developed

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GUIDE & CHECKLIST

CONSTRUCTION DOCUMENTATION PHASE

OVERVIEW

Proper documentation is critical for successful execution.

DOCUMENTATION CHECKLIST

1. Specifications
   - Material requirements defined
   - Installation tolerances specified
   - Quality control requirements detailed
   - Testing requirements documented
   - Mockup requirements specified

2. Details
   - Connection details developed
   - Fire protection details completed
   - Acoustic separation detailed
   - Envelope interfaces defined
   - MEP integration detailed

QUALITY BUILDINGS IS HERE TO HELP
...EVERY STEP OF THE WAY.

CONTACT US FOR YOUR DESIGN CONSULTATION.

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COMPARATIVE CONSTRUCTION METRICS:
MASS TIMBER VS. TRADITIONAL METHODS

SPEED TO MARKET

Installation Rates (10,000 sq ft floor plate)

- Mass Timber: 5-7 days per floor
- Steel: 7-10 days per floor
- Cast-in-Place Concrete: 8-12 days per floor

Overall Project Timeline (100,000 sq ft building)

- Mass Timber: 12-14 months
- Steel: 14-16 months
- Concrete: 16-18 months

LABOR REQUIREMENTS

Crew Size (typical floor installation)

- Mass Timber: 8-10 workers
- Steel: 12-14 workers
- Concrete: 15-18 workers

Skilled Labor Dependencies

- Mass Timber: Lower - fewer trades on site
- Steel: Moderate - multiple trade coordination
- Concrete: Higher - multiple trade dependencies

ENVIRONMENTAL IMPACT

Carbon Footprint (per square foot)

- Mass Timber: -25 to -35 kg CO2 (The negative CO2 values reflect carbon sequestration in the wood.)
- Steel: +75 to +85 kg CO2
- Concrete: +65 to +75 kg CO2

Construction Waste

- Mass Timber: 5-10% material waste
- Steel: 10-15% material waste
- Concrete: 15-20% material waste

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COMPARATIVE CONSTRUCTION METRICS:
MASS TIMBER VS. TRADITIONAL METHODS

BUILDING PERFORMANCE

Thermal Performance (R-value per inch)
- Mass Timber: R-1.25 per inch (must specify the type of mass timber (e.g., CLT, Glulam) for accuracy)
- Steel: R-0 (thermal bridge)
- Concrete: R-0.08 per inch

Weight Comparison (per square foot)
- Mass Timber Floor: 20-25 lbs/sf
- Steel Floor: 35-40 lbs/sf
- Concrete Floor: 80-85 lbs/sf

COST FACTORS

Foundation Costs (relative)
- Mass Timber: Base cost
- Steel: +10-15%
- Concrete: +25-30%

Interior Finish Costs
- Mass Timber: -20-30% (exposed structure)
- Steel: Base cost
- Concrete: Base cost + finish

CONSTRUCTION SITE IMPACT

Site Traffic (delivery trucks)
- Mass Timber: 25-30% fewer deliveries
- Steel: Base comparison
- Concrete: 40-50% more deliveries

Noise Levels (average decibels)
- Mass Timber: 70-80 dB
- Steel: 85-95 dB
- Concrete: 90-100 dB

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COMPARATIVE CONSTRUCTION METRICS:
MASS TIMBER VS. TRADITIONAL METHODS

LONG TERM BUILDING PERFORMANCE

Energy Efficiency (annual operating costs)
- Mass Timber: -15-20%
- Steel: Base comparison
- Concrete: Base comparison + 5-10%

Maintenance Requirements (50-year span)
- Mass Timber: Lower maintenance (if detailed and constructed properly)
- Steel: Moderate maintenance
- Concrete: Higher maintenance

MARKET PERFORMANCE

Lease Rate Premium
- Mass Timber: +5-15% (market dependent)
- Steel: Market rate
- Concrete: Market rate

Tenant Satisfaction
- Mass Timber: 15-20% higher
- Steel: Baseline
- Concrete: Baseline

RISK, SAFETY & INSURANCE

Weather Sensitivity
- Mass Timber: Lower impact
- Steel: Moderate impact
- Concrete: Higher impact

Schedule Certainty
- Mass Timber: Higher
- Steel: Moderate
- Concrete: Lower

Builder's Risk Insurance
- Mass Timber: +0-5%
- Steel: Baseline
- Concrete: Baseline

Construction Safety (incident rates)
- Mass Timber: 15% lower
- Steel: Baseline
- Concrete: Baseline

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COMPARATIVE CONSTRUCTION METRICS:
MASS TIMBER VS. TRADITIONAL METHODS

REFERENCES & RESEARCH

Industry Reports & Research

- WoodWorks Wood Products Council "Mass Timber Construction Cost and Design Optimization"; "Mass Timber Performance: Understanding Fire, Acoustic and Structural Properties"
- Mass Timber Institute (MTI) "Mass Timber Building Performance Reports"
- Think Wood "Mass Timber Cost and Performance Comparison Reports"
- American Wood Council (AWC)"National Design Specification for Wood Construction"
- USDA Forest Products Laboratory"Mass Timber Market Analysis"

Academic Sources

- University of Oregon TallWood Design Institute"Mass Timber Performance Studies"
- University of British Columbia"Comparative Life Cycle Assessment of Mass Timber Buildings"
- FPInnovations"Mass Timber Building Performance Reports"

Recent Industry Studies

- Dodge Data & Analytics "SmartMarket Report: Prefabrication and Modular Construction 2020"
- Carbon Leadership Forum "Life Cycle Assessment of Mass Timber Buildings"
- Architecture 2030 "Carbon Smart Materials Palette"

Specific Case Studies

- LendleaseCase studies of mass timber projects (T3 buildings series).
- Structurlam Performance data from completed mass timber projects.
- LEVER Architecture Framework for mass timber projects

Project-Specific Research

- Journal of Architectural EngineeringVarious peer-reviewed studies on mass timber performance
- Journal of Building EngineeringComparative studies on construction methods

International Resources

- Timber Development UK"Timber Construction Fact Sheets"
- Nordic WoodPerformance data from European mass timber projects
- International Mass Timber ConferenceAnnual proceedings and presentation data

Insurance and Risk Assessment

- AXA XL Construction"Mass Timber Construction: Insurer's Perspective"
- Forest Business NetworkEconomic impact and market reports

*Magnitude of time savings can vary based on project complexity and team experience.
**Mass timber's prefabrication and precise engineering can lead to fewer site queries.

Different mass timber products can result in differing performance metrics (e.g., thermal performance).

Some metrics (e.g., insurance costs, lease rates) can vary significantly based on location and market conditions.