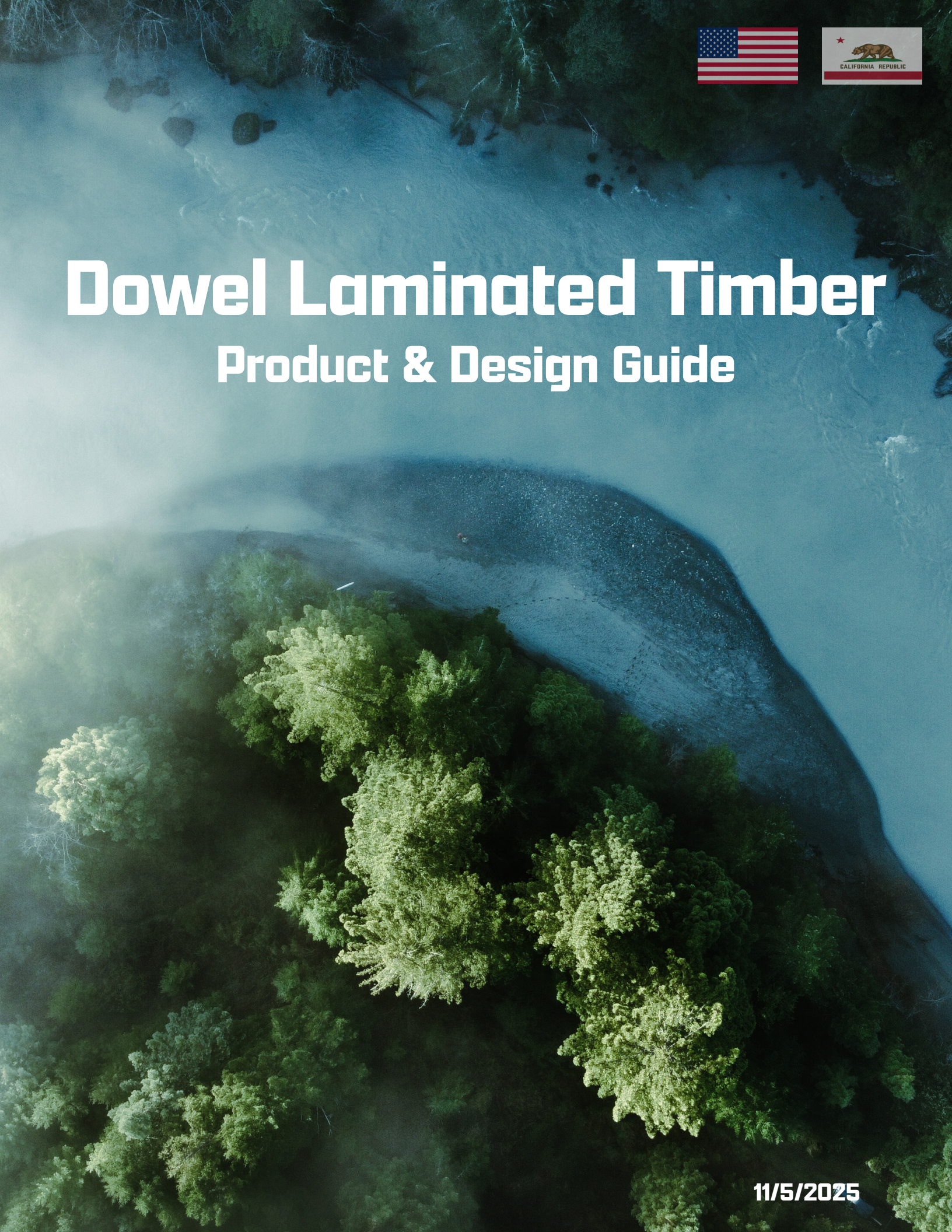

Dowel Laminated Timber

Product & Design Guide

11/5/2025

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Company Profile

At the Schmidbauer Group, we have a long history in California's forestry and wood products industry, known for our innovation and deep commitment to the local community. With a focus on sustainable practices, we continue our multigenerational tradition of producing building materials that support California's growth.

A Legacy of Timber Excellence

The Schmidbauer family's sawmilling legacy in California began in the 1940s and has since endured decades of economic cycles, tightening regulations, and dynamic challenges in the timber industry. These experiences have shaped a company dedicated to perpetual innovation, process and resource efficiency, investment in people, and sustainable practices. Today, the Schmidbauer Group is a vertically integrated enterprise encompassing timberland management, sawmills, and biomass waste-to-energy operations. With diverse locations and extensive industry networks, the Schmidbauer Group efficiently sources FSC-certified timber from nearly every corner of Northern California and into Southern Oregon, ensuring a reliable and sustainable supply of quality materials.

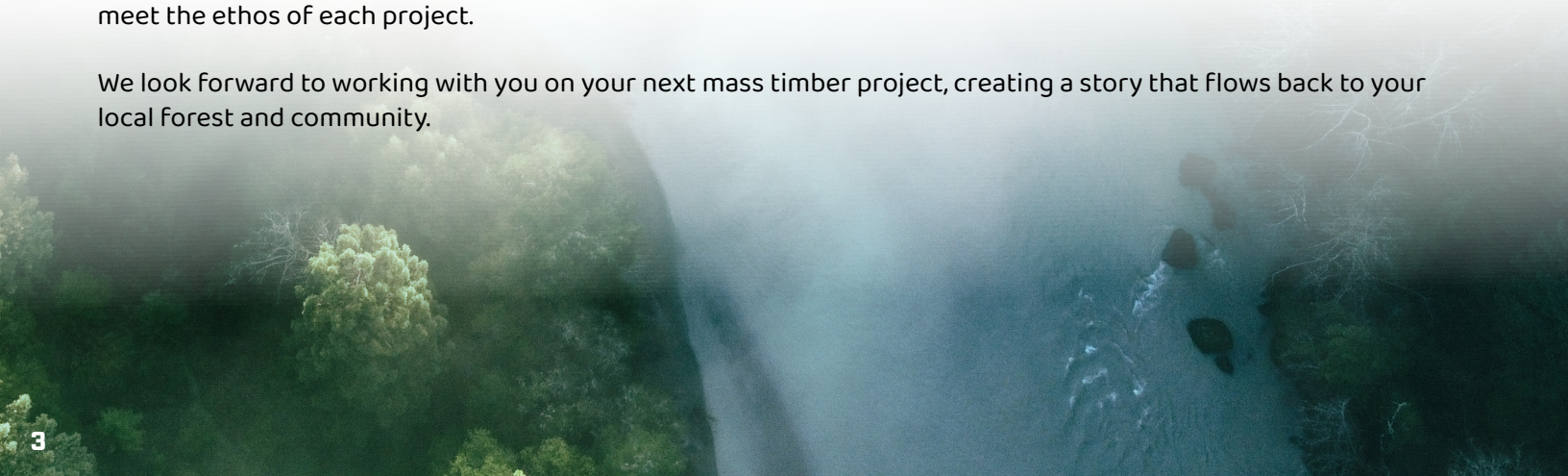
Mad River Mass Timber - the Next Generation of Innovation

As we look to the future, the demand for innovative, sustainable, and locally sourced engineered wood products continues to grow. With a deep understanding of our region's forests and processing infrastructure, Mad River Mass Timber (MRMT) emerges to meet these modern demands. Given the specific environmental and economic challenges faced by California and its neighboring states, MRMT recognizes our responsibility to offer products that are derived from forest stewardship that enriches the land for future generations, utilize wood fiber practically and efficiently, meet market demands for low-carbon construction, align with the region's diverse forests and processing infrastructure, and promote the health and well-being of end users. After an extensive R&D process, we have found Dowel Laminated Timber (DLT) to be the mass timber product that best meets these criteria.

At Mad River Mass Timber, we produce DLT panels for use as prefabricated mass timber floors, roofs, walls, and beams in commercial, residential, and industrial buildings of all sizes. Our vertical integration with Schmidbauer Group sawmills provides exceptional processing efficiency, a stable and reliable supply chain, and transparent material sourcing.

With great respect for our region's timber resource, we approach each project with a focus on thoughtful design and responsible fiber sourcing. MRMT collaborates on projects in multiple capacities, from supplying raw DLT billets to delivering fully prefabricated mass timber packages. We can serve as a material supplier or an integrated partner in the design process, offering solutions tailored to project needs. Longstanding relationships with private, state, federal and tribal forest managers allows us to deliver custom and transparent sourcing stories that meet the ethos of each project.

We look forward to working with you on your next mass timber project, creating a story that flows back to your local forest and community.



California Context

Mass timber is revolutionizing the building industry by providing a sustainable, low-carbon, and prefabricated alternative to steel and concrete construction. In California, where wildfire resilience, seismic performance, and sustainability are key concerns, mass timber offers significant advantages. It supports carbon sequestration, reduces construction timelines, and offers excellent fire and seismic performance. With updated building codes allowing for taller wood buildings, mass timber plays a crucial role in the state's transition to greener, more efficient construction methods.

While California has led the nation in adopting mass timber construction, the absence of local manufacturing has required material sourcing from hundreds, if not thousands, of miles away. Mad River Mass Timber is bridging this supply gap, providing locally sourced and manufactured DLT that supports local forest health, reduces transportation impacts, and strengthens rural economies across California.

AB 2446: Embodied Carbon in Construction

California's Assembly Bill 2446 (AB 2446) establishes greenhouse gas reduction targets for the built environment by focusing on reducing embodied carbon in construction materials. Mass timber, and particularly DLT, aligns with this initiative by offering a renewable alternative that sequesters CO_2 and reduces reliance on carbon-intensive materials like steel and concrete. Sourcing DLT from MRMT ensures regional procurement with the lowest possible emissions from transportation and manufacturing. Key implementation milestones include:

- July 1, 2025 – Finalization of CARB's embodied carbon framework, including lifecycle assessment methodology and benchmarks
- January 1, 2026 – Establishment of a construction industry emissions baseline
- By 2030 – Targeted 20% reduction in GHG intensity of materials from baseline
- By 2035 – Targeted 40% reduction in GHG intensity from baseline

As part of this rollout, California is also updating its CalGreen building code to become the first in the nation to require embodied carbon reduction measures in nonresidential buildings over 100,000 square feet and school buildings over 50,000 square feet. Project teams must comply through a whole-building life cycle assessment (WBLCA) or by meeting prescriptive material thresholds. MRMT's locally produced DLT panels offer a practical and measurable solution for meeting these new carbon requirements.

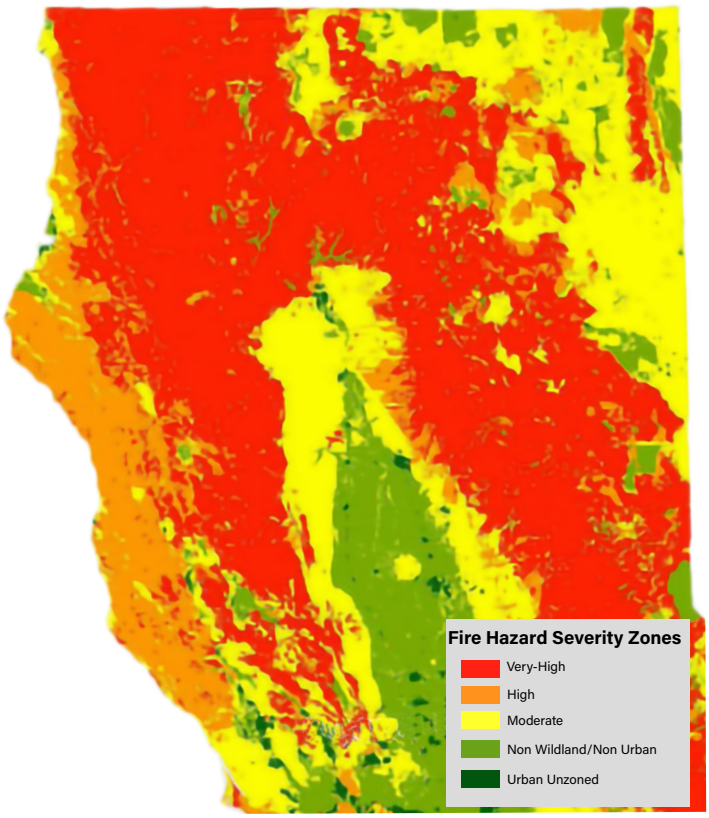
California Context

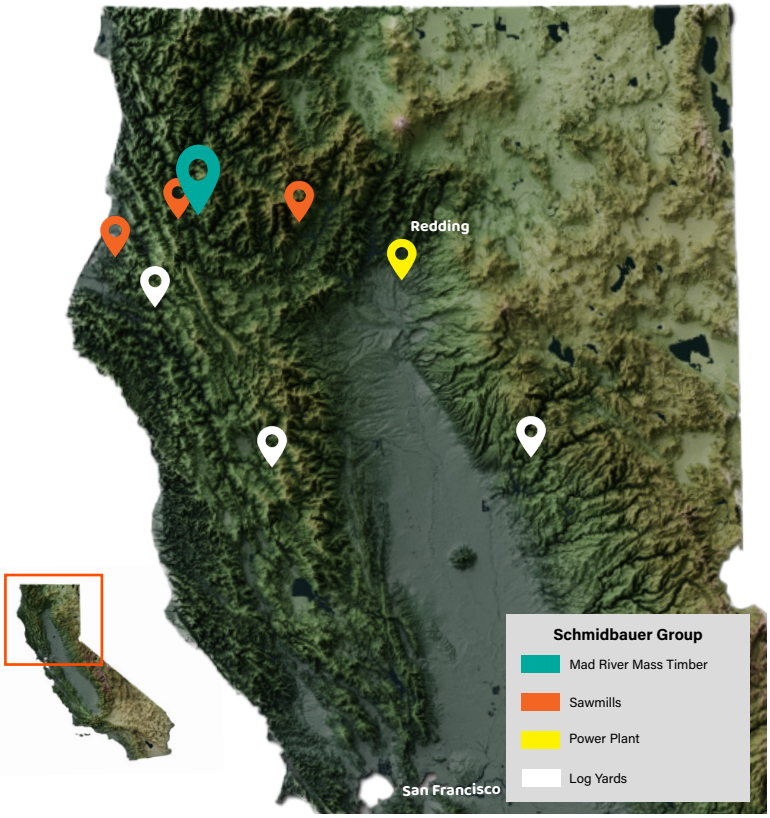
Addressing the Forest Health Crisis

California faces a severe forest health crisis, with overgrown forests creating excessive fuel loads and contributing to catastrophic wildfires. Forest health is also directly linked to the health of our watersheds, which have been experiencing the extremes of drought and flood. Active forest management - including thinning and other prescriptive treatments - is necessary to restore ecological balance and mitigate wildfire hazards. However, these management efforts generate significant byproducts, such as small-diameter timber and excess woody biomass. These byproducts of sustainable forest management must be connected to marketable products in order to support the pace and scale of work that is needed within California. Additionally, the diverse species mix throughout the state further complicates the issue, as some species do not meet the material requirements of traditional wood products.

Dowel Laminated Timber (DLT) is particularly well-suited to utilize small-diameter timber, converting it into high-value, durable building materials that store carbon within the built environment. DLT's simple design also allows it to accept a greater variety of tree species and lumber grades, making it the ultimate tool to drive forest restoration in California. By integrating locally sourced DLT into mass timber construction, we can simultaneously improve forest resilience, reduce wildfire risks, create low-carbon structures, and support rural communities across California.

The map on the left shows the extent of the problem in Northern California, with a large portion of our forests classified as Very-High Wildfire Hazard Severity Zone (WHSZ). The map on the right shows MRMT and Schmidbauer Group facilities, strategically situated to generate meaningful change across the state.





Sustainable Fiber Sourcing

Ensuring Transparency in Mass Timber

For architects, developers, and project sponsors, demonstrating a clear chain of custody from forest to finished product has become an essential requirement for sustainable building certifications, carbon reporting, and responsible material sourcing. However, due to the fragmented nature of North America's wood products industry, tracking fiber throughout the supply chain has historically been difficult.

Vertical Integration & Traceability

Mad River Mass Timber benefits from our vertical integration with Schmidbauer sawmills, ensuring a fully traceable supply chain from timber harvest to finished DLT panels. Our longstanding industry relationships and extensive log sourcing network allow us to work closely with private landowners, tribal entities, and public agencies to secure sustainable timber. Unlike many mass timber manufacturers, who rely on third-party lumber suppliers, our vertical integration provides greater control over fiber sourcing, transportation, and supply chain stability.

California's forest practice rules are widely regarded among the world's most rigorous frameworks for sustainable forest management.Specifying California-sourced mass timber ensures that harvesting occurs under stringency, science-based ecological safeguards. Mad River Mass Timber maintains a 100% California supply chain and sources intentionally across ownerships and management types to match each project with clear ecological and social co-benefits.

North Fork Lumber Company, Korbel, CA

Sustainable Fiber Sourcing

Private Timberland

Small, medium and large timberland owners regularly sell logs from their land to support a variety of management outcomes. Green Diamond Resource Company, our largest log supplier in the Coastal Region, is an example of sustainable forestry done at scale. Over the past 50 years, Green Diamond has worked with the State Board of Forestry to: pioneer Habitat Conservation Plans for multiple endangered species, establish some of the largest carbon projects in the state, and maintain data-sets to inform future improvements to the California Forest Practice Rules. They maintain FSC certification on all of their CA timberlands, often exceeding the requirements by a substantial margin.

Tribal Forests

The North Coast timber basket is home to 23 tribal nations, reservations and rancherias - the most concentrated group of Native American Tribes in California. Many of these groups actively manage their forests for a variety of outcomes: community wildfire resilience, wildlife and foraging habitat restoration, economic stability from timber revenue, and preservation of cultural values and traditional ecological knowledge. As one of the only transport-viable options for many coastal tribes to send logs to, we are proud to support the vast majority of tribal forest management in our region.

Public Lands

Our state-wide timber procurement infrastructure is capable of sourcing logs from all State and Federal Forests/ Parks in Northern California. Projects on public lands are often geared towards wildfire resilience, forest restoration, watershed protection and public utility. An example of this work is a project in Redwood National & State Parks, led by Save the Redwoods League, where selective thinning is used to accelerate restoration of redwood stands back to old growth conditions (pictured right). Small-diameter timber byproducts provide supplemental revenue for the project, and are ideal for conversion into high-strength DLT.

Targeted Restoration

The State Department of Forestry has proactively developed forest management permits that address the diverse restoration needs across ownership types. Some examples include:

- Oak Woodland Management Exemption - allows for removal of encroaching conifers to restore oak woodland and grasslands, vital for maintaining ecological balance and bio-diversity (pictured right).
- Forest Fire Prevention Exemption - allows tree removal aimed at reducing fire hazards, including the creation of defensible space around structures and along roads.
- Emergency Notice - permit issued for timber harvesting following catastrophic events like wildfire and pest outbreaks.
- Dead and Dying Exemption - allows for the harvesting of trees that are dead or dying, not exceeding 10% of the volume in any timber stand.

DLT Overiview

Structural Efficiency

- **Optimized for one-way spans** – with all wood fiber oriented in the direction of the primary span, DLT offers greater spans than CLT.
- **Reduced foundation loads** – building with mass timber results in a significantly lighter superstructure than steel and concrete, allowing for foundation sizes and costs to be reduced.
- **Applicable to buildings large & small**– DLT qualifies for use in larger and taller buildings under modern building codes, meeting the requirements of Type IV Heavy Timber.

Healthy Buildings

- **No adhesives or chemicals** – DLT panels are free from adhesives and volatile organic compounds (VOCs), drastically improving indoor air quality and reducing occupant exposure to toxins. Glue used in finger joints is less than 1% of that used in CLT.
- **Natural wood aesthetics** – Exposed wood surfaces create warm, inviting spaces that support cognitive function, physical health, and psychological wellbeing through biophilic design.
- **Acoustic performance** – DLT can be milled with integrated sound absorption profiles, reducing noise and enhancing comfort in living and working environments.

Environmental Sustainability

- **Carbon sequestration** – Wood used in DLT stores carbon for the lifespan of the building, reducing the overall carbon footprint of the building.
- **Reduced transportation** – As the southernmost mass timber manufacturer on the West Coast, MRMT provides the shortest shipping routes and associated transportation emissions to the Southwest US.
- **Reduced adhesives** –By relying on wooden dowel connections, DLT moves away from the use of structural adhesives, whose production relies on energy-intensive chemical processes, increasing their environmental footprint.
- **Responsibly sourced materials** - through its vertical integration with California sawmills, MRMT sources timber from responsibly managed forests in Northern California, following some of the world's most rigorous forest management policies. All products are FSC certified.
- **Alignment with AB 2446** – Provides a clear solution for exceeding California's new mandates for reducing embodied carbon in the built environment.
- **100% Recyclable** - DLT can be reused, disassembled, burned or composted at the building's end-of-life.

DLT Overview

Economically Viable

- **Efficient supply chain** – Vertical integration with Schmidbauer sawmills ensures cost control and manufacturing optimization.
- **High-value product from low-value materials** - DLT utilizes standard dimensional lumber with greater allowance for cosmetic defects compared to other mass timber products.
- **Cost competitive** – DLT provides an economical alternative to steel and concrete while delivering long-term performance benefits.

Forest Health

- **Utilization of small-diameter timber** – DLT provides a high-value market for wood harvested from forest health projects, which are being demanded throughout the state to reduce wildfire risks.
- **Accepting diverse species** – with minimal reliance on adhesive bonds, DLT has a greater ability to use under-utilized tree species that are often chipped and left in the forest or pile burned.

Construction Optimization

- **Prefabrication** – DLT panels are precision-milled off-site, reducing costly on-site modifications. All DLT panels come with sheathing factory applied.
- **Reduced schedule and labor**– large prefabricated elements allow a 5-person crew to erect over 2,000 sqft in one day.
- **Efficient construction site** - just-in-time deliveries of sequentially flat packed DLT panels reduces on-site storage, labor, and impacts to the surrounding area.
- **Integration with building systems** – factory coordinated service channels and penetrations accommodate electrical, plumbing, and HVAC systems.
- **Finish material** - mass timber reduces the need for drywall and dropped ceilings, allowing the natural timber to be exposed.

DLT Panel Specs

Panel Dimensions	**Length**	Up to 40'
	Width	Up to 8' in any increment
	Panel Thickness (excluding sheathing)	3.4" , 5.4" , 7.15" , 9.15" , 11.15"
	Lamella Width	1.5" , 2.5" , 3.5"
	Sheathing Thickness	Engineer to specify (3/8", 1/2", 5/8", 3/4", 1")
Grades	**Structural Grades**	Select Structural , #1&Btr , #2 , #3
	Diaphram Sheathing	Engineer to specify grade and thickness (plywwod or OSB)
	Appearance Grades	Architectural, Commercial, Industrial

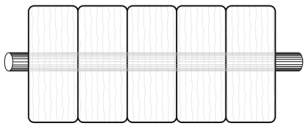
		DougFir	HemFir	Sitka Spruce	CA Redwood
Species	**Name per AWC NDS Supplement**	Douglas Fir-Larch	Hem-Fir	Spruce-Pine-Fir	Redwood
	Attributes	High-strength	Under-utilized species	Under-utilized species	Natural weather resistance
	Relative Cost	$$$	$$	$$	$$$$
	Density (lbs/cf)	36.2	31.1	30.4	26.8

Panel Profiles	**Standard**	Square, Eased, Chamfer, Kerfed
	Fluted	Single, Double, Random 2x4/2x6 , 2x6/2x8 , etc.
	Custom	Custom molder profiles and/or lamination widths upon request
Panel Tolerances		+/- 1/8" width, +/- 1/4" length, +/- 2% depth (at time of manufacture)
Moisture Content		12%-19% (at time of manufacture)
Fire Resistance		Meets **Type-IV Heavy Timber** requirements of IBC. Calculate char rate in accordance with **AWC NDS Chapter 16. 2x6 DLT** assemblies have been tested to achieve up to **2-hour Fire Resistance Rating** (FRR). Greater FRR achievable with thicker panels.
Accoustic Performance		**34 STC / 33 IIC** for bare 2x6 DLT **>50 STC / >50 IIC** tested assemblies available with concrete topping and accoustic mat
R-Value		1.25 per inch of DLT
Specific Heat Capacity		0.38 Btu/lb-F @ 62 F and 12% mc

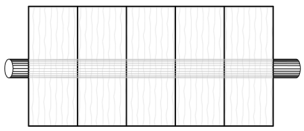
Profiles & Appearance

Before the DLT lamination process, each lamella is run through a planer-molder for final sizing and profiling. Custom knife profiles can be applied to the bottom face of each lamella, shaping the exposed surface of the finished panel. This unique feature of DLT provides designers with a range of aesthetic options while also enhancing acoustic performance.

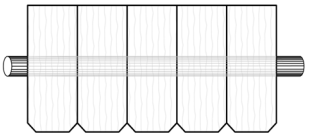
Standard - the profiles below can be applied to 2x, 3x, and 4x panels at no extra cost.



Eased Edge

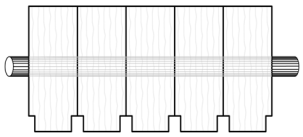


Square Edge

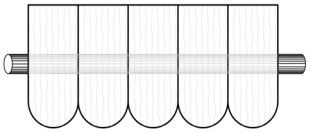


Chamfer Edge
Edge

Kerfed Edge

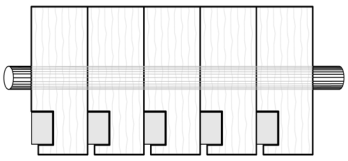


Double Kerfed Edge

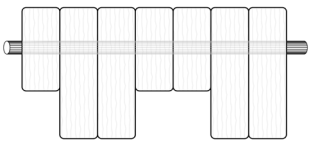


Bullnose

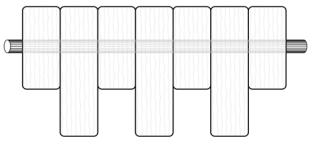
Acoustic DLT - integration of acoustic fiber into milled chases on the exposed surface of walls and ceilings allows for the absorption of sound waves from an occupied space. This leads to superior indoor acoustics that would otherwise only be achieved by the addition of acoustic paneling over the top of the timber finish. ASTM C423 testing is currently underway on a variety of acoustic DLT profiles . NRC value's will be available soon.



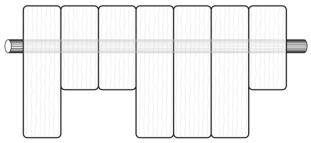
Custom panel layups can be achieved by varying lamella depth and thickness. Fluted panels offer unique aesthetics, enhanced sound dampening, and structural performance proportional to the average lamella depth. Lamella of greater thickness, like 3" and 4", offer a clean look with greater spacing between laminations.



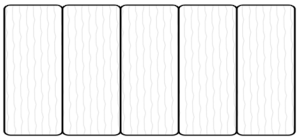
Double Flute



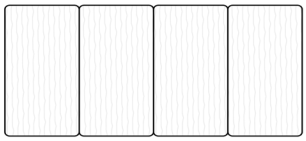
Single Flute



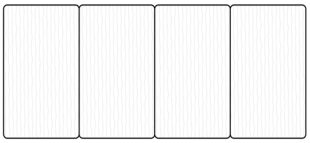
Random Flute



2 x 6



3 x 6

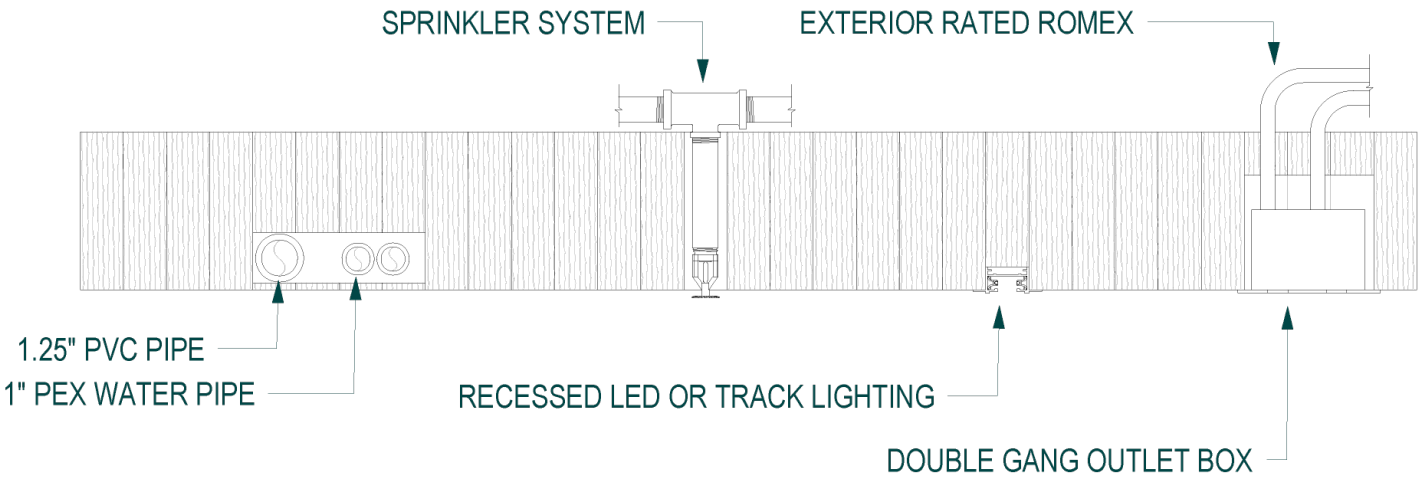


4 x 6

Profiles & Appearance

MEPF Integration

DLT panels can be made with chases to accommodate mechanical, electrical, plumbing, and fire (MEPF) systems. These chases can be created by custom milling, use of narrower lamella, or leaving gaps between DLT panels. Chases can be left open or covered with a variety of materials. Diligent BIM coordination is required to ensure successful integration into the manufacturing process.



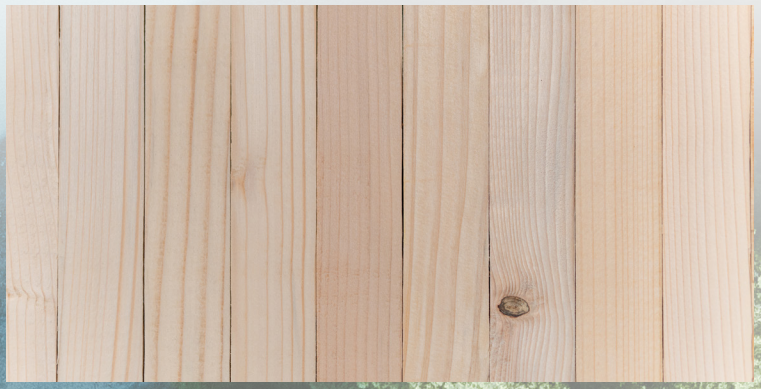
Panel Appearance

The appearance of exposed DLT panels is influenced by several factors including species, lamella dimensions, lumber grade defects (wane, knots, checks), panel profiles, and finish coatings. Unless clear, defect-free panels are specified, we prefer to allow the natural defects allowed under the specified lumber grade to drive panel appearance. Panels made from #1&Btr lumber will have smaller knots and minimal wane, while panels made with #3 lumber will have larger knots and more pronounced wane.

To ensure your design vision aligns with material characteristics, we encourage early discussions with our team to establish appearance expectations for your project.

DougFir

HemFir



Design Considerations

Dowel-laminated timber (DLT) panels can be used as floor slabs, roof slabs, walls, columns, and beams in mass timber and other hybrid structures. They are made from individual pieces of lumber (lamella) joined together in a stacked configuration by long hardwood dowels. The dowels create a tight friction fit and mechanically laminate the lamella into a solid mass timber panel. The dowels ensure the lateral transfer of gravity loads between lamella, but are otherwise considered non-structural fasteners. In general, the design of DLT elements follow the rules of standard structural timber elements according to the American Wood Council, National Design Specifications for Wood Construction (AWS, NDS-WC), where DLT panels are evaluated as a series of 'beams' or 'stringers'.

MRMT manufactures DLT panels using three methods, each having unique structural and environmental characteristics:

1. **Continuous DLT** - panel lengths are limited by standard lumber lengths - up to 20 feet.
   - Completely adhesive free - 100% wood.
   - Greater ability to accept reclaimed lumber, under-utilized species, and byproducts of local forest restoration.

2. **Finger Jointed DLT** - panel lengths up to 60' are made using a finger jointer machine that creates structural end jointed lamella.
   - Finger jointed lamella have equal structural performance of the input lumber.
   - These end joints use a structural adhesive that collectively represents less than 1% of the adhesives used in cross laminated timber.

3. **Butt Jointed DLT** - panel lengths up to 60' are made by arranging standard length lumber (up to 20') with staggered butt joints throughout the panel. Spacing of the butt joints is designed around each project's strucutral grid. Butt Jointed DLT panels will have unique bending strength and stiffness reductions for each use case. The dowels now serve a structural function to bridge forces between the butt joints.
   - Completely adhesive free - 100% wood.
   - Greater ability to accept reclaimed lumber, under-utilized species, and byproducts of local forest restoration.
   - Follow guidance in **NLT U.S. Design & Construction Guide** to estimate strength reductions.

For a detailed analysis and final specifications, please refer to a licensed engineering office, MRMT, and the following resources:

- International Building Codes (IBC), International Residential Codes (IRC), and California Building Codes (CBC) for Type IV requirements, heavy timber construction.
- American Wood Council, National Design Specifications for Wood Construction (AWS, NDS-WC) for guidelines on bending, shear, and fire performance.
  - Chapter 3 - Design Provisions and Equations
  - Chapter 4 - Sawn Lumber
  - Chapter 16 - Fire Design of Wood Members
- Special Design Provisions for Wind and Seismic (AWC-SDPWS) for lateral resistance and diaphragm action.
- Nail Laminated Timber (NLT) U.S. Design & Construction Guide for guidance that also applies to DLT for architectural considerations, structural calculations, fire design, connection details, and construction best practices.

Design Considerations

Floor and Roof Slabs - Strength and Stiffness

The structural design of a DLT panel is based on the strength and stiffness of each lamination, according to the AWS, NDS-WC. The span tables on pages 17 - 20 can be used during preliminary design to estimate the spanning capability of various panel types. These simplified design tables consider the most common use cases of DLT panels for a quick estimation of panel sizes based on strength, deflection, and vibration requirements of standard building spans. Span tables are provided for our most common timber species and lumber grades, with lower grades typically resulting in lower material costs.

For Butt Jointed DLT panels, reduction factors are taken into account based on specific fabrication characteristics. Typical reduction factors for butt jointed panels can be found in the U.S. Nail-Laminated Timber Design Guide by WoodWorks. Contact MRMT for project specific butt joint designs.

Floor and Roof Slabs - Diaphragms

DLT panels have only a minimal capacity to be activated as a diaphragm. In most cases, the diaphragm action depends on the addition of plywood or OSB sheathing on top of the panel. With the addition of a sheathing, DLT panels are considered 'fully blocked' diaphragms per the AWC SDPWS (Special Design Provisions for Wind and Seismic loads). The standard DLT panel includes factory-applied sheathing to satisfy the diaphragm requirements of each project when required.

Wall Panels

DLT panels with sheathing can be used as both bearing and shear walls, allowing for exposed timber walls. Shear wall design simply follows the standard formulations in AWC SDPWS for fully blocked diaphragms.

Stair and Elevator Core Panels

DLT panels can be used to construct 2hr rated stair and elevator shafts. The prefabricated panels offer faster construction and comparable performance when compared to steel and concrete cores.

Beams

DLT can be used as beam elements or mechanically laminated timber beams, equivalent to a narrow panel, available in nominal depths up to 12" and any width.

Weak-Axis Cantilevers

Cantilevers in the direction perpendicular to the span direction (weak-axis) can be performed by DLT panels with additional detailing and reinforcement.

- Cantilevers up to 18" are typically attainable with screw reinforcing.
- Longer weak-axis cantilevers can be accomplished with strong-backs or additional framing elements on top of the panel.

Design Considerations

Penetrations

DLT panels can be easily pre-fabricated with openings to accommodate various building systems. MEPF penetrations can be identified early during BIM coordination and precision cut in our facility or cut onsite using standard construction equipment.

- Penetrations up to 4" wide/diameter can be made without additional reinforcements.
- Penetrations over 4" wide/diameter should be reinforced with screws.
- For large penetrations over 12", additional steel reinforcing may be required.

Refer to the NLT U.S. Design & Construction Guide, Chapter 4.4, for more detail.

Vibration

Given DLT's high strength-to-weight ratio, vibrations become more likely to govern floor design as spans increase. Vibration should be discussed early in the project to understand users' expectations and determine appropriate design criteria. The vibration behavior of DLT is performed using the Simplified Procedure (simplified modal formula, p.32) described in the U.S. Mass Timber Floor Vibration Design Guide by Woodworks. A natural panel frequency for the applied load above 6 Hz is considered reasonable at a preliminary design stage. A more detailed analysis by a licensed engineer is required to fully capture the vibration behavior.

Fire Performance

DLT fire performance compliance is typically achieved by meeting the Heavy Timber requirements of IBC Sections 602.4 & 2304.11, and demonstrating through calculations that enough timber remains after the design fire period. The methods outlined in AWC NDS Chapter 16 and AWC TR-10 involve calculating the char rate, determining the char depth, and evaluating the load bearing capacity of the remaining structural element. These methods are based on wood's char behavior established by extensive ASTM E119 testing. MRMT's DLT panels meet these heavy timber standards and can achieve fire resistance ratings (FRR) of up to two hours or more. A panel's FRR increases with panel thickness, allowing higher ratings to be achieved by increasing panel thickness.

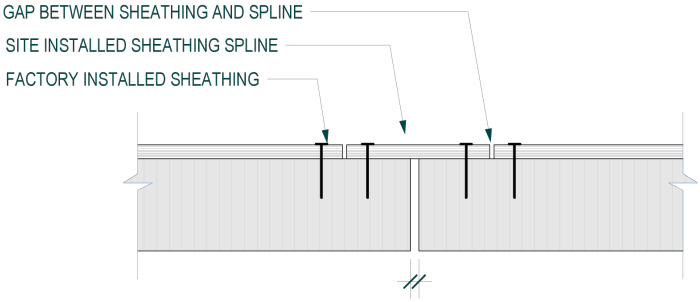
DLT floor assemblies have been successfully tested by FP Innovations in accordance with CAN/ULC-S101, achieving 2-hour FRR with 2x6 DLT panels and 3-hour FRR with 2x8 DLT panels.

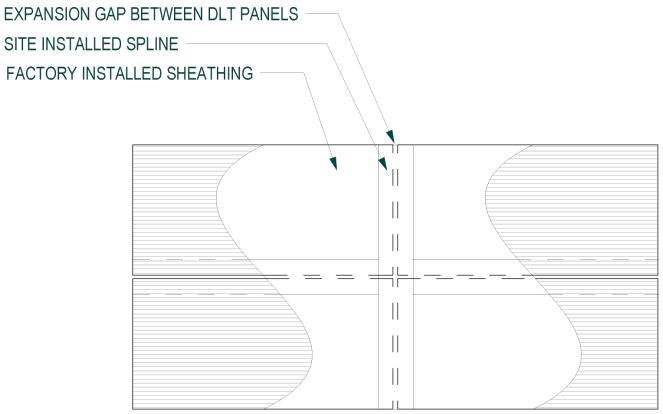
Unlike CLT, which exposes a new timber face as burned layers fall away, DLT maintains a consistent char rate with all lamella run in the span direction. This enables superior fire performance of DLT over standard CLT panels.

Acoustic Performance

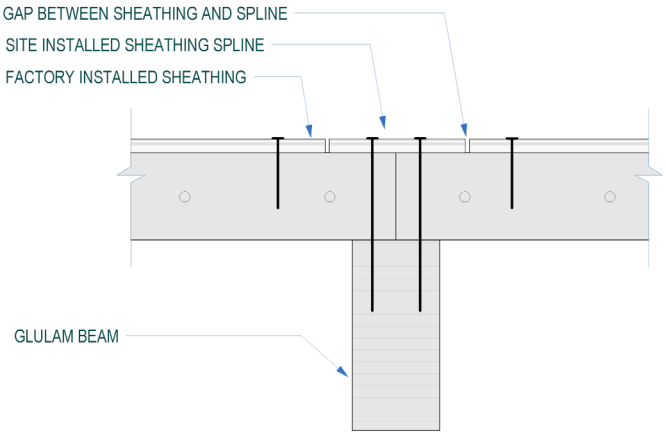
Like other mass timber panels, DLT rarely meets the acoustic requirements of buildings and is often combined with a concrete topping and/or acoustic mat to achieve desired acoustic ratings. Unlike other mass timber panels, DLT allows for custom surface profiles that create an uneven surface and diffuse reflection of sound waves. This results in superior interior acoustic performance.

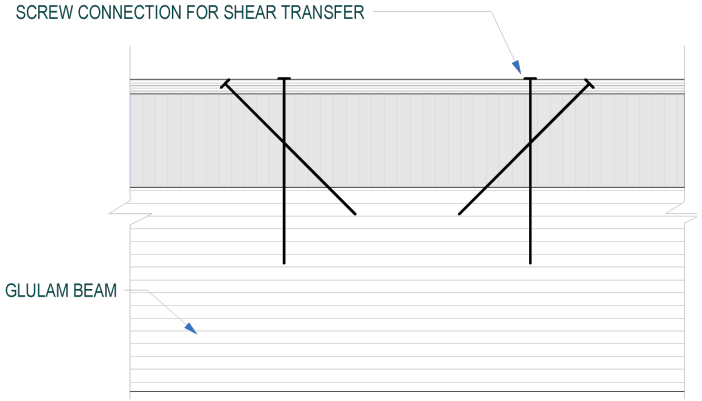
Connection Details



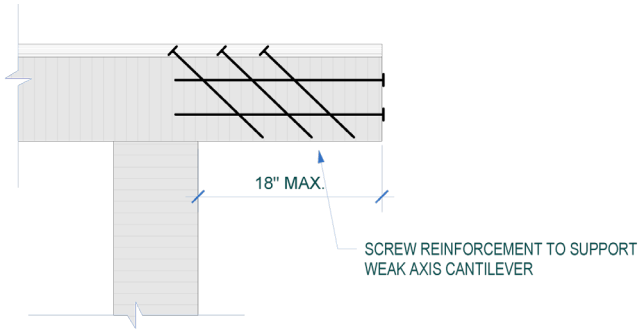


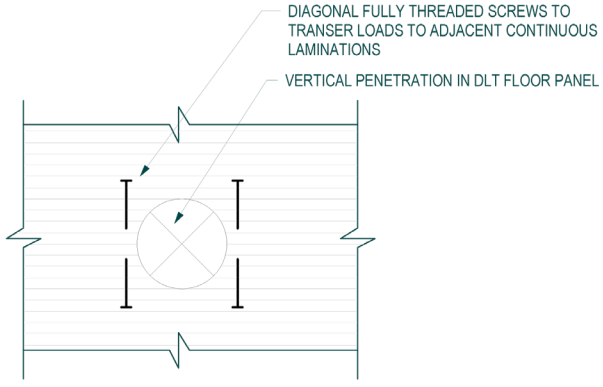
DLT PANEL-TO-PANEL CONNECTION





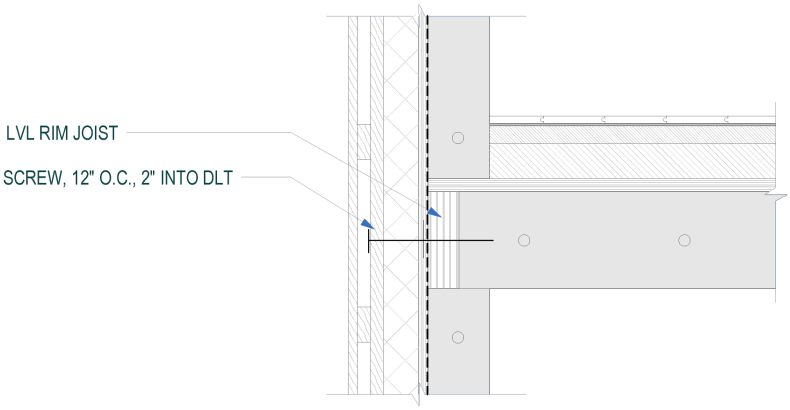
DLT PANEL BEARING ON GLULAM BEAM



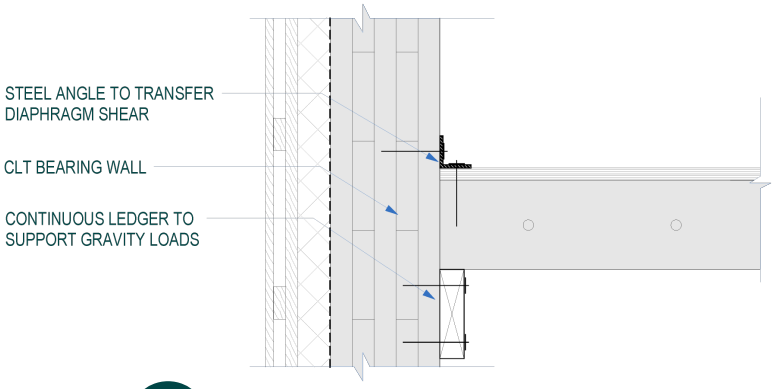


DLT PANEL-TO-PANEL CONNECTION

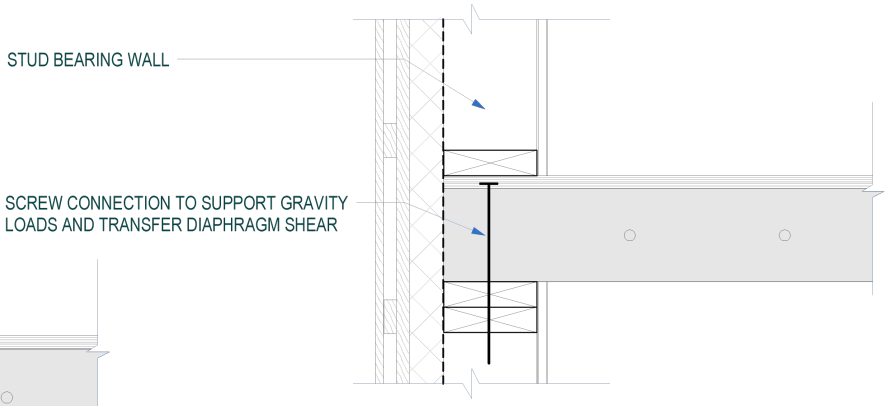
Connection Details



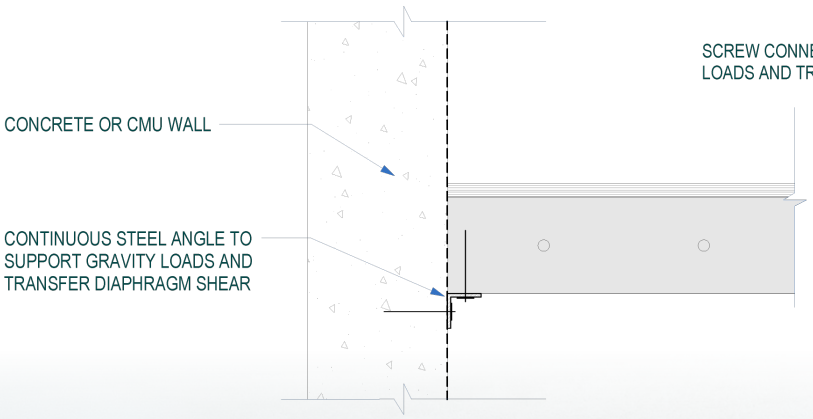
DLT FLOOR TO DLT SHEAR WALL



DLT FLOOR TO CLT WALL

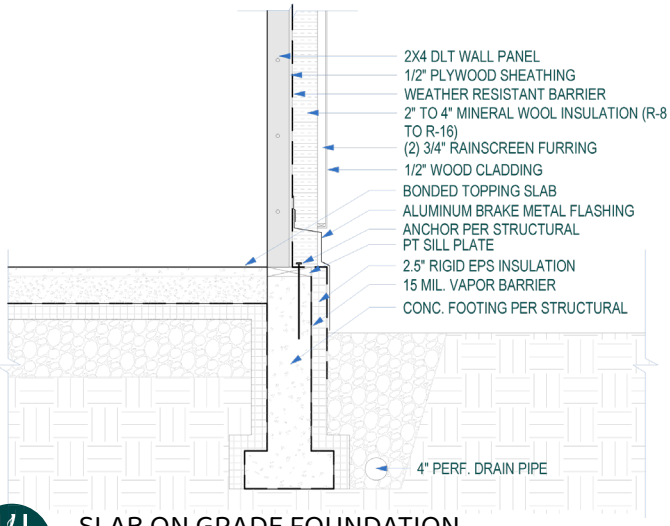


DLT FLOOR TO WOOD STUD WALL

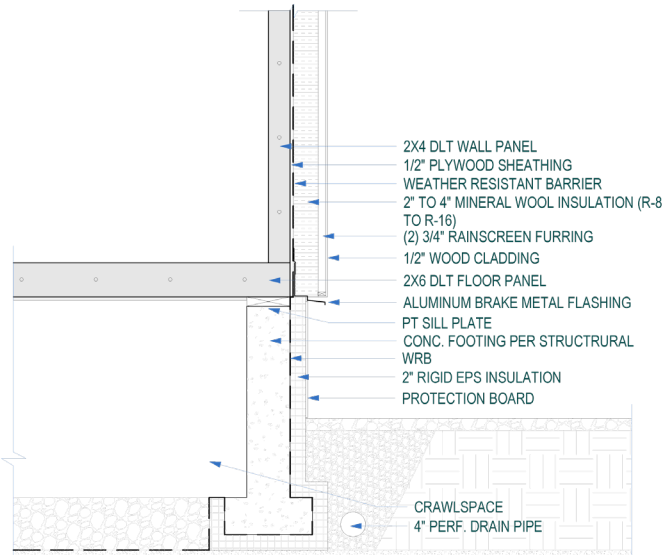


DLT FLOOR TO CONCRETE WALL

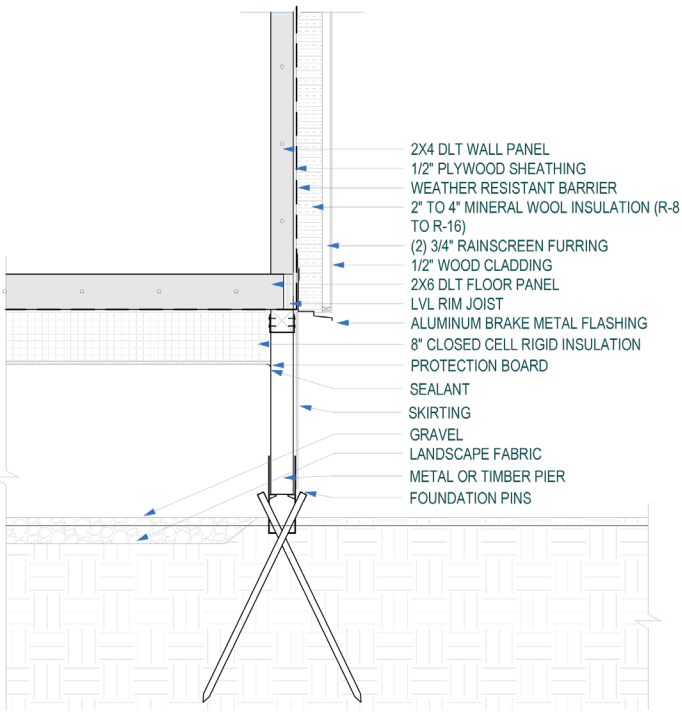
Connection Details



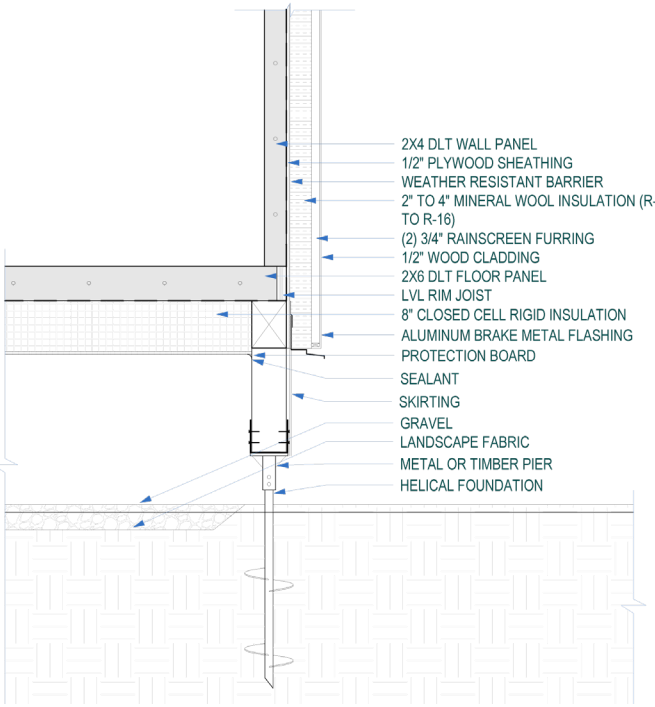
SLAB ON GRADE FOUNDATION



CRAWL SPACE FOUNDATION

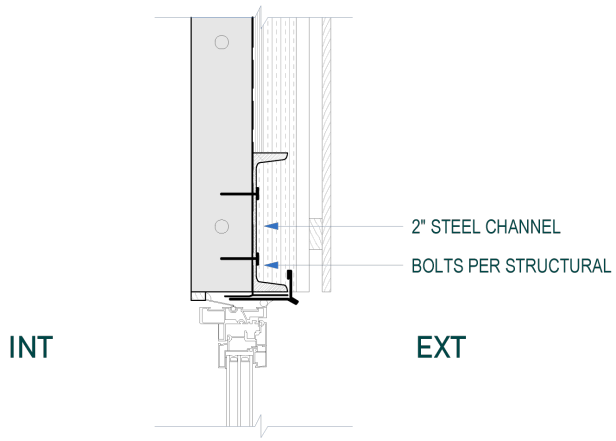


PIN FOUNDATION

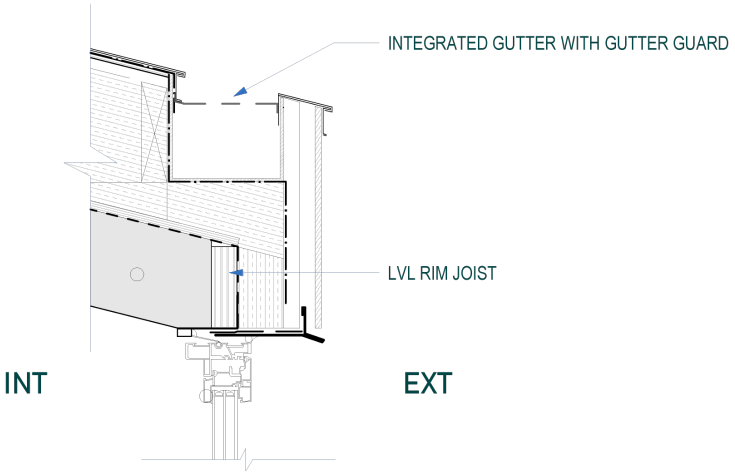


HELICAL PIN FOUNDATION

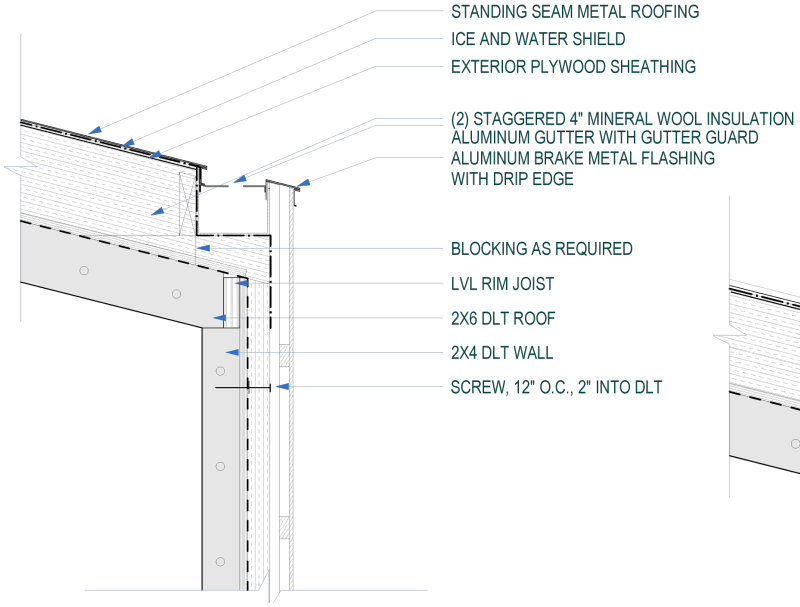
Connection Details



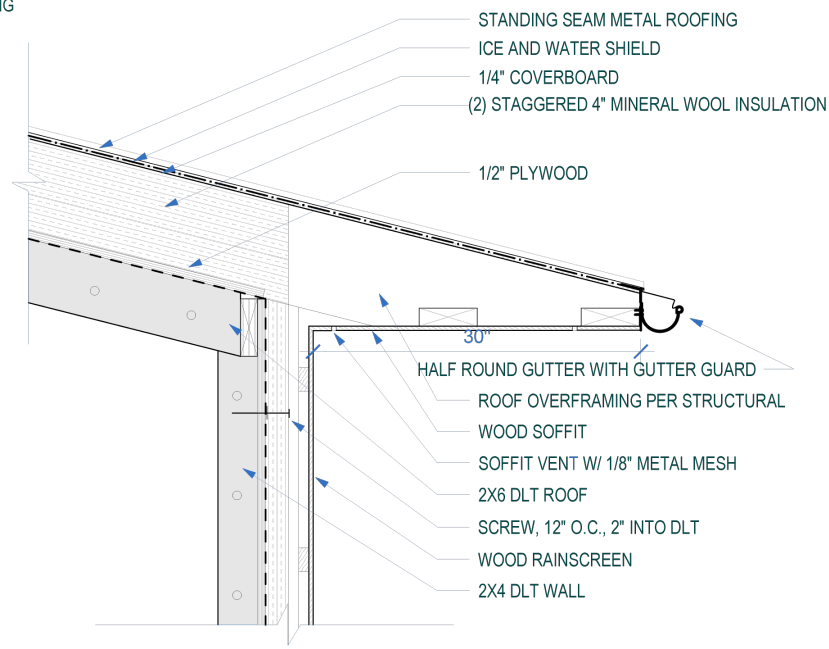
STEEL C CHANNEL HEADER WITH VERTICAL DLT PANEL



RIM JOIST HEADER AT FULL HEIGHT OPENING



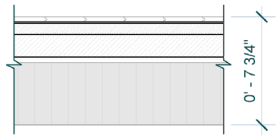
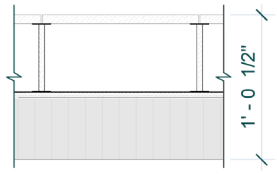
DLT WALL TO SLOPED ROOF



DLT WALL TO SLOPED ROOF WITH OVERHANG

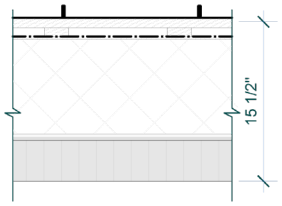
Assemblies Details

Floor Assemblies

DESC	ASSEMBLY	STC / IIC RATING
MULTIFAMILY / OFFICE: TYPICAL ASSEMBLY	 LVP OR LINOLEUM FLOORING 1 3/4" GYPCRETE TOPPING SLAB 3/8" ACCOUSTIC MAT 1/2" PLYWOOD / OSB SHEATHING 2X6 DLT PANEL	STC: 52* IIC: 50*
MULTIFAMILY / OFFICE: DRY ASSEMBLY	 7/16" ENGINEERED OR HARDWOOD 1/8" GENIEMAT RST05 1" GENIEBOARD 302 2" GENIEMAT FF50i W/ STEEL TRACK PLYWOOD / OSB SHEATHING 2X6 DLT PANEL	STC: 52* IIC: 50*
SINGLE FAMILY: EXPOSED CEILING	 7/16" ENGINEERED OR HARDWOOD 1/2" PLYWOOD / OSB SHEATHING 2X6 DLT PANEL	NONE REQUIRED
SINGLE FAMILY: EXPOSED FLOOR	 2X6 DLT PANEL 1/2" PLYWOOD / OSB SHEATHING OPTIONAL: GWB	NONE REQUIRED
OFFICE / INSTITUTIONAL: RAISED ACCESS FLOOR	 FLOOR ACCESS PANELS 6" ADJUSTABLE PEDESTALS 1/2" COMPOSITE SHEATHING 2X6 DLT PANEL	NONE REQUIRED

* ALL STC/IIC RATINGS ARE ESTIMATES. ACTUAL VALUES TO BE CONFIRMED BY DESIGN TEAM.
RAW 2X6 DLT = STC 38 AND IIC 33 PER STRUCTURECRAFT DESIGN GUIDE

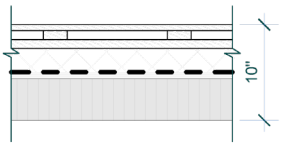
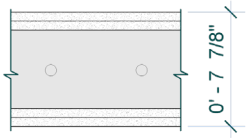
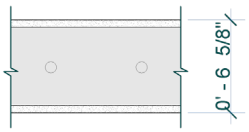
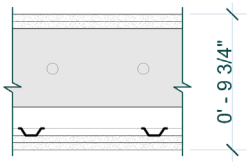
Roof Assemblies

DESC	ASSEMBLY	RATING
DLT PANEL WITH METAL STANDING SEAM ROOFING	 DOUBLE-LOCK STANDING SEAM METAL ROOFING (2) 3/4" RAINSCREEN FURRING ICE AND WATER SHIELD 1/4" COVERBOARD 8" MINERAL WOOL (R33.6) 1/2" PLYWOOD SHEATHING (R0.63) VAPOR PERMEABLE WEATHER RESISTANT BARRIER (WRB) 2X4 DLT (R5.16)	R-40

[2] APPLICABLE FOR HUMBOLDT COUNTY, CA [CLIMATE ZONE 1, CEC]

Assemblies Details

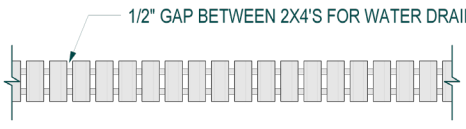
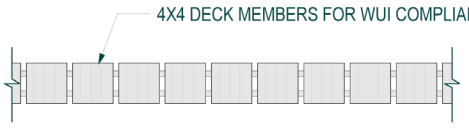
Wall Assemblies

DESC	ASSEMBLY	RATING
EXTERIOR IECC MASS WALL WITH WOOD RAINSCREEN [2] [3]	 EXT. AIR FILM (R0.17) 1/2" WOOD RAINSCREEN (R0.63) (2) 3/4" RAINSCREEN FURRING MIN. 2" MINERAL WOOL (R8.4) VAPOR PERMEABLE WEATHER RESISTANT BARRIER (WRB) 1/2" PLYWOOD SHEATHING (R0.63) 2X4 DLT (R5.16) INT AIR FILM (R0.68)	R-23
TYPE IV-A AND IV-B COMPLIANT DLT SHAFT WALL	 (2) LAYERS 5/8" TYPE X GYP 2X6 DLT WALL (2) LAYERS 5/8" TYPE X GYP	*2 HR FRR = 80 MINUTES NON-COMBUSTIBLE MATERIAL ON EITHER SIDE PER IBC 602.4.2.1*
TYPE IV-C COMPLIANT DLT SHAFT WALL	 (1) LAYER 1/2" TYPE X GYP 2X6 DLT WALL (1) LAYER 1/2" TYPE X GYP	*1 HR FRR = 40 MINUTES NON-COMBUSTIBLE MATERIAL ON EITHER SIDE PER IBC 602.4.2.1*
DLT SHAFT WALL	 (2) LAYERS 1/2" TYPE X GYP RESILIENT CHANNELS 2X2 FRAMING 2X6 DLT PANEL (2) LAYERS 1/2" TYPE X GYP	

[2] APPLICABLE FOR HUMBOLDT COUNTY, CA (CLIMATE ZONE 1, CEC)

[3] 2X4 DLT + 1/2" PLYWOOD CONSIDERED MASS WALL PER CEC TITLE 24, PART 6, TABLE 150.1-A

Deck Assemblies

DESC	ASSEMBLY	RATING
SPACED-DLT DECK PANEL[2]		
SPACED-DLT DECK PANEL, WUI COMPLIANT		

Span Tables

DougFir - Floor

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: SELECT STRUCTURAL	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x6	2x6
11	2x4	2x4	2x4	2x6	2x6	2x6
12	2x4	2x4	2x6	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x8
16	2x6	2x6	2x6	2x6	2x8	2x8
17	2x6	2x6	2x6	2x8	2x8	2x8
18	2x6	2x6	2x8	2x8	2x8	2x8
19	2x6	2x6	2x8	2x8	2x8	2x8
20	2x6	2x8	2x8	2x8	2x8	2x10
22	2x8	2x8	2x8	2x10	2x10	2x10
24	2x8	2x8	2x10	2x10	2x10	2x10
26	2x10	2x10	2x10	2x10	2x12	2x12
28	2x10	2x10	2x12	2x12	2x12	2x12
30	2x12	2x12	2x12	2x12	-	-
32	2x12	2x12	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: SELECT STRUCTURAL	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x4	2x6	2x6	2x6
14	2x4	2x4	2x6	2x6	2x6	2x6
15	2x4	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x8
19	2x6	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x8	2x8	2x8
22	2x6	2x6	2x8	2x8	2x8	2x8
24	2x6	2x8	2x8	2x8	2x8	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x8	2x10	2x10	2x10	2x10	2x12
32	2x10	2x10	2x10	2x10	2x12	2x12

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: SELECT STRUCTURAL	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x8
16	2x6	2x6	2x6	2x6	2x8	2x8
17	2x6	2x6	2x8	2x8	2x8	2x8
18	2x6	2x8	2x8	2x8	2x8	2x8
19	2x8	2x8	2x8	2x8	2x8	2x8
20	2x8	2x8	2x8	2x8	2x8	2x10
22	2x8	2x8	2x10	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	2x10	2x10
26	2x10	2x10	2x12	2x12	2x12	2x12
28	2x12	2x12	2x12	2x12	2x12	-
30	2x12	2x12	-	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: SELECT STRUCTURAL	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x6
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x6	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x8
19	2x6	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x8	2x8	2x8
22	2x6	2x6	2x8	2x8	2x8	2x8
24	2x6	2x8	2x8	2x8	2x8	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x10	2x10	2x10	2x10	2x10	2x12
32	2x10	2x10	2x10	2x10	2x12	2x12

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: #1 & BTR	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x4	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x4	2x6	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x8	2x8
16	2x6	2x6	2x6	2x8	2x8	2x8
17	2x6	2x6	2x8	2x8	2x8	2x8
18	2x6	2x6	2x8	2x8	2x8	2x8
19	2x6	2x8	2x8	2x8	2x8	2x10
20	2x6	2x8	2x8	2x8	2x10	2x10
22	2x8	2x8	2x8	2x10	2x10	2x10
24	2x8	2x10	2x10	2x10	2x10	2x12
26	2x10	2x10	2x10	2x10	2x12	2x12
28	2x10	2x10	2x12	2x12	2x12	2x12
30	2x12	2x12	2x12	2x12	-	-
32	2x12	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: #1 & BTR	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x6
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x4	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x6	2x8	2x8	2x8	2x8	2x8
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	2x10
28	2x8	2x10	2x10	2x10	2x10	2x12
30	2x10	2x10	2x10	2x10	2x12	2x12
32	2x10	2x10	2x12	2x12	2x12	-

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: #1 & BTR	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x4	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x8	2x8
16	2x6	2x6	2x6	2x8	2x8	2x8
17	2x6	2x6	2x8	2x8	2x8	2x8
18	2x6	2x8	2x8	2x8	2x8	2x8
19	2x8	2x8	2x8	2x8	2x8	2x10
20	2x8	2x8	2x8	2x8	2x10	2x10
22	2x8	2x8	2x10	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	2x10	2x12
26	2x10	2x10	2x12	2x12	2x12	2x12
28	2x12	2x12	2x12	2x12	2x12	-
30	2x12	-	-	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: #1 & BTR	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x4	2x6	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x6	2x8	2x8	2x8	2x8	2x8
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	2x10
28	2x8	2x10	2x10	2x10	2x10	2x12
30	2x10	2x10	2x10	2x10	2x12	2x12
32	2x10	2x10	2x12	2x12	2x12	-

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: #2	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x8
15	2x6	2x6	2x6	2x6	2x8	2x8
16	2x6	2x6	2x6	2x8	2x8	2x8
17	2x6	2x8	2x8	2x8	2x8	2x8
18	2x6	2x8	2x8	2x8	2x8	2x10
19	2x6	2x8	2x8	2x8	2x10	2x10
20	2x6	2x8	2x8	2x10	2x10	2x10
22	2x8	2x8	2x8	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	2x12	2x12
26	2x10	2x10	2x10	2x12	2x12	2x12
28	2x10	2x12	2x12	2x12	2x12	-
30	2x12	2x12	2x12	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: #2	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x8
17	2x6	2x6	2x6	2x6	2x8	2x8
18	2x6	2x6	2x6	2x8	2x8	2x8
19	2x6	2x6	2x8	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x10
22	2x8	2x8	2x8	2x8	2x10	2x10
24	2x8	2x8	2x8	2x10	2x10	2x12
26	2x8	2x10	2x10	2x10	2x12	2x12
28	2x10	2x10	2x10	2x12	2x12	-
30	2x10	2x10	2x12	2x12	-	-
32	2x10	2x12	2x12	-	-	-

Species: HEM-FIR	Single Span					
Grade: #2	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x6
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x6	2x6	2x6	2x6	2x6
11	2x6	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x8
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x8
16	2x6	2x8	2x8	2x8	2x8	2x8
17	2x8	2x8	2x8	2x8	2x8	2x10
18	2x8	2x8	2x8	2x8	2x10	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x10	2x10	2x10	2x10
22	2x10	2x10	2x10	2x10	2x10	-
24	2x10	2x10	-	-	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: #2	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x8
17	2x6	2x6	2x6	2x6	2x8	2x8
18	2x6	2x6	2x6	2x8	2x8	2x8
19	2x6	2x6	2x8	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x10
22	2x8	2x8	2x8	2x8	2x10	2x10
24	2x8	2x8	2x8	2x10	2x10	2x12
26	2x8	2x10	2x10	2x10	2x12	2x12
28	2x10	2x10	2x10	2x12	2x12	-
30	2x10	2x10	2x12	2x12	-	-
32	2x10	2x12	2x12	-	-	-

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: #3	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x8
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x6	2x8	2x8	2x8
16	2x6	2x6	2x8	2x8	2x8	2x8
17	2x6	2x6	2x8	2x8	2x8	2x10
18	2x6	2x8	2x8	2x8	2x10	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x8	2x10	2x10	2x12
22	2x8	2x8	2x10	2x10	2x12	2x12
24	2x10	2x10	2x10	2x12	-	-
26	2x10	2x10	2x12	-	-	-
28	2x12	2x12	-	-	-	-
30	2x12	-	-	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: #3	No Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x4	2x6	2x6
11	2x4	2x4	2x4	2x6	2x6	2x6
12	2x4	2x4	2x6	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x8
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x6	2x8	2x8	2x8
16	2x6	2x6	2x8	2x8	2x8	2x8
17	2x6	2x6	2x8	2x8	2x8	2x10
18	2x6	2x8	2x8	2x8	2x10	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x8	2x10	2x10	2x12
22	2x8	2x8	2x10	2x10	2x12	2x12
24	2x10	2x10	2x10	2x12	-	-
26	2x10	2x10	2x12	-	-	-
28	2x12	2x12	-	-	-	-
30	2x12	-	-	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Single Span					
Grade: #3	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x4	2x6	2x6	2x6	2x6
11	2x6	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x8	2x8
14	2x6	2x6	2x6	2x8	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x8
16	2x6	2x8	2x8	2x8	2x8	2x10
17	2x8	2x8	2x8	2x8	2x10	2x10
18	2x8	2x8	2x8	2x10	2x10	2x10
19	2x8	2x8	2x10	2x10	2x10	2x12
20	2x8	2x10	2x10	2x10	2x12	2x12
22	2x10	2x10	2x10	2x12	2x12	-
24	2x10	2x12	2x12	-	-	-
26	2x12	2x12	-	-	-	-
28	2x12	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH	Double Span					
Grade: #3	2.0 in Concrete Topping					
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x8	2x8
14	2x6	2x6	2x6	2x8	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x8
16	2x6	2x8	2x8	2x8	2x8	2x10
17	2x6	2x8	2x8	2x8	2x10	2x10
18	2x8	2x8	2x8	2x10	2x10	2x10
19	2x8	2x8	2x10	2x10	2x10	2x12
20	2x8	2x10	2x10	2x10	2x12	2x12
22	2x10	2x10	2x10	2x12	2x12	-
24	2x10	2x12	2x12	-	-	-
26	2x12	2x12	-	-	-	-
28	2x12	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Assumptions - Standard DLT Floors

1. Span tables are provided for preliminary design estimation only. Consult MRMT for further assistance.
2. Span tables assume major axis bending only, spanning parallel to the laminations and fully supported by members perpendicular to the span direction.
3. Calculations based on NDS Supplement: Design Values for Wood Construction 2018.
4. Calculations used the following factors: CM = 1.0, Ct - 1.0, Cr = 1.15, and Cf corresponding to member size.
5. Floors use CD = 1.0. Standard roofs use CD = 1.25. For roofs with snow loads, calculations must be modified to use CD = 1.15.
6. Dead Load calculations are based on the self-weight of panel and a Superimposed Dead Load (SDL) of: **20 psf**
7. Maximum deflection is limited to 2 in. for long spans. Deflection calculations reference the modulus method of NDS Appendix F.3.1. Shear Deflections are not explicitly calculated.
8. Deflection is calculated using the following deflection limits and loading conditions: Dead Load only Live Load only
9. Creep Deflection is calculated using 1.0DL+1.0LL and: **Kcr = 1.00** **L/240** **L/360**
10. Moment, shear, and deflection calculations are based on a design load combination of 1.0DL +1.0LL.
11. Evaluation of vibration is subjective and performance can be highly influenced by the structural system as a whole. Each project should be independently reviewed by the EOR with reference to the U.S. Mass Timber Floor Vibration Guide. MRMT span tables assume a Minimum Fundamental Frequency of 4 Hz and use the Simplified Procedures on pg. 32 of the Vibration Guide.
12. Where double span conditions are specified, the spans are assumed to be within 10% of each other. Tabulated values consider both a full and a partial live loading pattern in accordance with CBC Section 1607.13, and the maximum effects are accounted for.
13. The tabulated preliminary designs are not effected by lamination thickness; results apply for 2x, 3x and 4x laminations.
14. For simple, continuous and cantilevered bending members, span shall be taken as the distance from face-to-face of supports, plus 1/2 the required bearing length at each end.
15. Calculations are for Continuous DLT panels up to 20' in length and Finger Jointed DLT panels up to 60' in length. The above span tables do not apply to Butt Jointed DLT panels, which will have reduced spanning capacity and require project specific engineering.
16. Fire resistance calculations are not included, consult MRMT for assistance.

Span Tables

HemFir - Floor

Species: HEM-FIR						Single Span
Grade: SELECT STRUCTURAL						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x8
15	2x6	2x6	2x6	2x8	2x8	2x8
16	2x6	2x6	2x6	2x8	2x8	2x8
17	2x6	2x6	2x8	2x8	2x8	2x8
18	2x6	2x6	2x8	2x8	2x8	2x10
19	2x6	2x8	2x8	2x8	2x8	2x10
20	2x8	2x8	2x8	2x8	2x10	2x10
22	2x8	2x8	2x8	2x10	2x10	2x10
24	2x8	2x10	2x10	2x10	2x10	-
26	2x10	2x10	2x10	-	-	-
28	2x10	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: SELECT STRUCTURAL						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x4	2x6	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x4	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x8	2x8	2x8	2x8	2x8	2x8
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	-
30	2x8	2x10	2x10	2x10	-	-
32	2x10	2x10	2x10	-	-	-

Species: HEM-FIR						Single Span
Grade: SELECT STRUCTURAL					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x8
15	2x6	2x6	2x6	2x6	2x8	2x8
16	2x6	2x6	2x8	2x8	2x8	2x8
17	2x6	2x8	2x8	2x8	2x8	2x8
18	2x8	2x8	2x8	2x8	2x8	2x10
19	2x8	2x8	2x8	2x8	2x8	2x10
20	2x8	2x8	2x8	2x10	2x10	2x10
22	2x8	2x10	2x10	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	-	-
26	2x10	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: SELECT STRUCTURAL					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x8	2x8	2x8	2x8	2x8	2x10
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	2x10
28	2x10	2x10	2x10	2x10	2x10	-
30	2x10	2x10	2x10	2x10	-	-
32	2x10	-	-	-	-	-

Species: HEM-FIR						Single Span
Grade: #1 & BTR						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x4	2x6	2x6	2x6	2x6
12	2x4	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x8
15	2x6	2x6	2x6	2x6	2x8	2x8
16	2x6	2x6	2x6	2x8	2x8	2x8
17	2x6	2x8	2x8	2x8	2x8	2x8
18	2x6	2x8	2x8	2x8	2x8	2x10
19	2x6	2x8	2x8	2x8	2x10	2x10
20	2x8	2x8	2x8	2x8	2x10	2x10
22	2x8	2x8	2x10	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	2x10	2x10
26	2x10	2x10	2x10	-	-	-
28	2x10	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: #1 & BTR						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x4	2x6	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x8	2x8	2x8	2x8	2x8	2x10
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x10	2x10	2x10	2x10	-	-
32	2x10	-	-	-	-	-

Species: HEM-FIR						Single Span
Grade: #1 & BTR					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x4	2x6	2x6	2x6	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x8
15	2x6	2x6	2x6	2x8	2x8	2x8
16	2x6	2x6	2x8	2x8	2x8	2x8
17	2x6	2x8	2x8	2x8	2x8	2x8
18	2x8	2x8	2x8	2x8	2x8	2x10
19	2x8	2x8	2x8	2x8	2x10	2x10
20	2x8	2x8	2x8	2x10	2x10	2x10
22	2x10	2x10	2x10	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: #1 & BTR					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x6	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x8	2x8
18	2x6	2x6	2x6	2x8	2x8	2x8
19	2x6	2x6	2x8	2x8	2x8	2x8
20	2x6	2x8	2x8	2x8	2x8	2x8
22	2x8	2x8	2x8	2x8	2x10	2x10
24	2x8	2x8	2x8	2x10	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	2x10
28	2x10	2x10	2x10	2x10	-	-
30	2x10	2x10	2x10	-	-	-
32	2x10	-	-	-	-	-

Species: HEM-FIR						Single Span
Grade: #2						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x6
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x4	2x6	2x6	2x6	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x8
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x8
16	2x6	2x8	2x8	2x8	2x8	2x8
17	2x8	2x8	2x8	2x8	2x8	2x10
18	2x8	2x8	2x8	2x8	2x10	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x10	2x10	2x10	2x10
22	2x8	2x8	2x10	2x10	2x10	2x10
24	2x10	2x10	2x10	2x10	2x10	-
26	2x10	2x10	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: #2						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x6	2x8	2x8	2x8
16	2x6	2x8	2x8	2x8	2x8	2x8
17	2x8	2x8	2x8	2x8	2x8	2x10
18	2x8	2x8	2x8	2x8	2x10	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x10	2x10	2x10	2x10
22	2x10	2x10	2x10	2x10	2x10	-
24	2x10	2x10	-	-	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Single Span
Grade: #2					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x6
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x6	2x6	2x6	2x6	2x6
11	2x6	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x8
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x8
16	2x6	2x8	2x8	2x8	2x8	2x8
17	2x8	2x8	2x8	2x8	2x8	2x10
18	2x8	2x8	2x8	2x8	2x10	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x10	2x10	2x10	2x10
22	2x10	2x10	2x10	2x10	2x10	-
24	2x10	2x10	-	-	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: #2					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x6
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x6	2x6	2x6	2x6
13	2x4	2x6	2x6	2x6	2x6	2x6
14	2x6	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x8	2x8
17	2x6	2x6	2x6	2x8	2x8	2x8
18	2x6	2x6	2x8	2x8	2x8	2x8
19	2x6	2x8	2x8	2x8	2x8	2x8
20	2x6	2x8	2x8	2x8	2x8	2x10
22	2x8	2x8	2x8	2x8	2x10	2x10
24	2x8	2x8	2x8	2x10	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	2x10
28	2x10	2x10	2x10	2x10	-	-
30	2x10	2x10	2x10	-	-	-
32	2x10	-	-	-	-	-

Species: HEM-FIR						Single Span
Grade: #3						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x6
9	2x4	2x4	2x4	2x4	2x6	2x6
10	2x4	2x4	2x6	2x6	2x6	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x6	2x8
14	2x6	2x6	2x6	2x6	2x8	2x8
15	2x6	2x6	2x6	2x8	2x8	2x8
16	2x6	2x6	2x8	2x8	2x8	2x8
17	2x6	2x8	2x8	2x8	2x8	2x8
18	2x8	2x8	2x8	2x8	2x8	2x10
19	2x8	2x8	2x8	2x10	2x10	2x10
20	2x8	2x8	2x10	2x10	2x10	2x10
22	2x8	2x10	2x10	2x10	2x10	-
24	2x10	2x10	-	-	-	-
26	2x10	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: #3						No Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x4	2x6	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x6
13	2x6	2x6	2x6	2x6	2x8	2x8
14	2x6	2x6	2x6	2x8	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x10
16	2x6	2x8	2x8	2x8	2x10	2x10
17	2x8	2x8	2x8	2x10	2x10	2x10
18	2x8	2x8	2x8	2x10	2x10	-
19	2x8	2x8	2x10	2x10	2x10	-
20	2x8	2x10	2x10	2x10	-	-
22	2x10	2x10	-	-	-	-
24	2x10	-	-	-	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Single Span
Grade: #3					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x6
9	2x4	2x4	2x4	2x6	2x6	2x6
10	2x4	2x6	2x6	2x6	2x6	2x6
11	2x6	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x8
13	2x6	2x6	2x6	2x6	2x8	2x8
14	2x6	2x6	2x6	2x8	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x10
16	2x6	2x8	2x8	2x8	2x10	2x10
17	2x8	2x8	2x8	2x10	2x10	2x10
18	2x8	2x8	2x8	2x10	2x10	-
19	2x8	2x8	2x10	2x10	2x10	-
20	2x8	2x10	2x10	2x10	-	-
22	2x10	2x10	-	-	-	-
24	2x10	-	-	-	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Species: HEM-FIR						Double Span
Grade: #3					2.0 in	Concrete Topping
Span (ft)	Live Load (psf)					
	40	60	80	100	125	150
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x6
10	2x4	2x4	2x4	2x6	2x6	2x6
11	2x4	2x6	2x6	2x6	2x6	2x6
12	2x6	2x6	2x6	2x6	2x6	2x8
13	2x6	2x6	2x6	2x6	2x8	2x8
14	2x6	2x6	2x6	2x8	2x8	2x8
15	2x6	2x6	2x8	2x8	2x8	2x10
16	2x6	2x8	2x8	2x8	2x10	2x10
17	2x6	2x8	2x8	2x10	2x10	2x10
18	2x8	2x8	2x8	2x10	2x10	-
19	2x8	2x8	2x10	2x10	2x10	-
20	2x8	2x10	2x10	2x10	-	-
22	2x10	2x10	-	-	-	-
24	2x10	-	-	-	-	-
26	-	-	-	-	-	-
28	-	-	-	-	-	-
30	-	-	-	-	-	-
32	-	-	-	-	-	-

Assumptions - Standard DLT Floors

1. Span tables are provided for preliminary design estimation only. Consult MRMT for further assistance.
2. Span tables assume major axis bending only, spanning parallel to the laminations and fully supported by members perpendicular to the span direction.
3. Calculations based on NDS Supplement: Design Values for Wood Construction 2018.
4. Calculations used the following factors: CM = 1.0, Ct - 1.0, Cr = 1.15, and Cf corresponding to member size.
5. Floors use CD = 1.0. Standard roofs use CD = 1.25. For roofs with snow loads, calculations must be modified to use CD = 1.15.
6. Dead Load calculations are based on the self-weight of panel and a Superimposed Dead Load (SDL) of: **20 psf**
7. Maximum deflection is limited to 2 in. for long spans. Deflection calculations reference the modulus method of NDS Appendix F.3.1. Shear Deflections are not explicitly calculated.
8. Deflection is calculated using the following deflection limits and loading conditions: Dead Load only Live Load only
9. Creep Deflection is calculated using 1.0DL+1.0LL and: **Kcr = 1.00** **L/240** **L/360**
10. Moment, shear, and deflection calculations are based on a design load combination of 1.0DL +1.0LL.
11. Evaluation of vibration is subjective and performance can be highly influenced by the structural system as a whole. Each project should be independently reviewed by the EOR with reference to the U.S. Mass Timber Floor Vibration Guide. MRMT span tables assume a Minimum Fundamental Frequency of 4 Hz and use the Simplified Procedures on pg. 32 of the Vibration Guide.
12. Where double span conditions are specified, the spans are assumed to be within 10% of each other. Tabulated values consider both a full and a partial live loading pattern in accordance with CBC Section 1607.13, and the maximum effects are accounted for.
13. The tabulated preliminary designs are not effected by lamination thickness; results apply for 2x, 3x and 4x laminations.
14. For simple, continuous and cantilevered bending members, span shall be taken as the distance from face-to-face of supports, plus 1/2 the required bearing length at each end.
15. Calculations are for Continuous DLT panels up to 20' in length and Finger Jointed DLT panels up to 60' in length. The above span tables do not apply to Butt Jointed DLT panels, which will have reduced spanning capacity and require project specific engineering.
16. Fire resistance calculations are not included, consult MRMT for assistance.

Span Tables

DougFir - Roof

Species: DOUGLAS FIR-LARCH						Single Span
Grade: SELECT STRUCTURAL						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x6
13	2x4	2x4	2x4	2x4	2x6	2x6
14	2x4	2x4	2x4	2x6	2x6	2x6
15	2x4	2x4	2x6	2x6	2x6	2x6
16	2x4	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x6
19	2x6	2x6	2x6	2x6	2x6	2x8
20	2x6	2x6	2x6	2x6	2x8	2x8
22	2x6	2x6	2x6	2x8	2x8	2x8
24	2x6	2x8	2x8	2x8	2x8	2x8
26	2x8	2x8	2x8	2x8	2x10	2x10
28	2x8	2x8	2x8	2x10	2x10	2x10
30	2x8	2x10	2x10	2x10	2x10	2x10
32	2x10	2x10	2x10	2x10	2x12	2x12
34	2x10	2x10	2x10	2x12	2x12	2x12
36	2x10	2x10	2x12	2x12	2x12	2x12
38	2x10	2x12	2x12	2x12	-	-
40	2x12	2x12	2x12	-	-	-
42	2x12	2x12	-	-	-	-
44	2x12	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH						Single Span
Grade: SELECT STRUCTURAL						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x6
13	2x4	2x4	2x4	2x4	2x6	2x6
14	2x4	2x4	2x4	2x6	2x6	2x6
15	2x4	2x4	2x6	2x6	2x6	2x6
16	2x4	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x6
19	2x6	2x6	2x6	2x6	2x6	2x8
20	2x6	2x6	2x6	2x6	2x8	2x8
22	2x6	2x6	2x6	2x8	2x8	2x8
24	2x6	2x8	2x8	2x8	2x8	2x8
26	2x8	2x8	2x8	2x8	2x10	2x10
28	2x8	2x8	2x8	2x10	2x10	2x10
30	2x8	2x10	2x10	2x10	2x10	2x10
32	2x10	2x10	2x10	2x10	2x12	2x12
34	2x10	2x10	2x10	2x12	2x12	2x12
36	2x10	2x10	2x12	2x12	2x12	2x12
38	2x10	2x12	2x12	2x12	-	-
40	2x12	2x12	2x12	-	-	-
42	2x12	2x12	-	-	-	-
44	2x12	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH						Single Span
Grade: #1 & BTR						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x6
13	2x4	2x4	2x4	2x4	2x6	2x6
14	2x4	2x4	2x4	2x6	2x6	2x6
15	2x4	2x4	2x6	2x6	2x6	2x6
16	2x4	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x6
19	2x6	2x6	2x6	2x6	2x6	2x8
20	2x6	2x6	2x6	2x6	2x8	2x8
22	2x6	2x6	2x8	2x8	2x8	2x8
24	2x6	2x8	2x8	2x8	2x8	2x10
26	2x8	2x8	2x8	2x8	2x10	2x10
28	2x8	2x8	2x8	2x10	2x10	2x10
30	2x8	2x10	2x10	2x10	2x10	2x12
32	2x10	2x10	2x10	2x10	2x12	2x12
34	2x10	2x10	2x10	2x12	2x12	2x12
36	2x10	2x10	2x12	2x12	2x12	-
38	2x12	2x12	2x12	2x12	-	-
40	2x12	2x12	2x12	-	-	-
42	2x12	2x12	-	-	-	-
44	2x12	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH						Double Span
Grade: #1 & BTR						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x4
13	2x4	2x4	2x4	2x4	2x4	2x4
14	2x4	2x4	2x4	2x4	2x4	2x6
15	2x4	2x4	2x4	2x4	2x6	2x6
16	2x4	2x4	2x4	2x4	2x6	2x6
17	2x4	2x4	2x4	2x6	2x6	2x6
18	2x4	2x4	2x6	2x6	2x6	2x6
19	2x4	2x4	2x6	2x6	2x6	2x6
20	2x4	2x6	2x6	2x6	2x6	2x6
22	2x6	2x6	2x6	2x6	2x6	2x8
24	2x6	2x6	2x6	2x6	2x8	2x8
26	2x6	2x6	2x6	2x8	2x8	2x8
28	2x6	2x6	2x8	2x8	2x8	2x8
30	2x6	2x8	2x8	2x8	2x8	2x10
32	2x6	2x8	2x8	2x8	2x10	2x10
34	2x8	2x8	2x8	2x10	2x10	2x10
36	2x8	2x8	2x8	2x10	2x10	2x10
38	2x8	2x8	2x10	2x10	2x10	2x12
40	2x8	2x10	2x10	2x10	2x12	2x12
42	2x10	2x10	2x10	2x12	2x12	2x12
44	2x10	2x10	2x10	2x12	2x12	-
46	2x10	2x10	2x12	2x12	2x12	-
48	2x10	2x10	2x12	2x12	-	-
50	2x10	2x12	2x12	-	-	-

Species: DOUGLAS FIR-LARCH						Single Span
Grade: #2						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x4	2x4	2x6	2x6
14	2x4	2x4	2x4	2x6	2x6	2x6
15	2x4	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x8
19	2x6	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x6	2x8	2x8
22	2x6	2x8	2x8	2x8	2x8	2x8
24	2x8	2x8	2x8	2x10	2x10	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x10	2x10	2x10	2x10	2x12	2x12
32	2x10	2x10	2x10	2x12	2x12	2x12
34	2x10	2x10	2x12	2x12	2x12	2x12
36	2x10	2x12	2x12	2x12	-	-
38	2x12	2x12	2x12	-	-	-
40	2x12	2x12	-	-	-	-
42	2x12	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH						Double Span
Grade: #2						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x4
13	2x4	2x4	2x4	2x4	2x4	2x4
14	2x4	2x4	2x4	2x4	2x4	2x6
15	2x4	2x4	2x4	2x4	2x6	2x6
16	2x4	2x4	2x4	2x4	2x6	2x6
17	2x4	2x4	2x4	2x6	2x6	2x6
18	2x4	2x4	2x6	2x6	2x6	2x6
19	2x4	2x6	2x6	2x6	2x6	2x6
20	2x4	2x6	2x6	2x6	2x6	2x6
22	2x6	2x6	2x6	2x6	2x6	2x8
24	2x6	2x6	2x6	2x6	2x8	2x8
26	2x6	2x6	2x6	2x8	2x8	2x8
28	2x6	2x6	2x8	2x8	2x8	2x8
30	2x6	2x8	2x8	2x8	2x8	2x10
32	2x6	2x8	2x8	2x8	2x10	2x10
34	2x8	2x8	2x8	2x10	2x10	2x10
36	2x8	2x8	2x8	2x10	2x10	2x10
38	2x8	2x8	2x10	2x10	2x10	2x12
40	2x8	2x10	2x10	2x10	2x12	2x12
42	2x10	2x10	2x10	2x12	2x12	2x12
44	2x10	2x10	2x10	2x12	2x12	-
46	2x10	2x10	2x12	2x12	2x12	-
48	2x10	2x10	2x12	2x12	-	-
50	2x10	2x12	2x12	-	-	-

Species: DOUGLAS FIR-LARCH						Single Span
Grade: #3						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x6
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x4	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x6	2x8	2x8	2x8	2x8	2x10
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	2x12
28	2x8	2x10	2x10	2x10	2x12	2x12
30	2x10	2x10	2x10	2x12	2x12	-
32	2x10	2x10	2x10	2x12	-	-
34	2x10	2x12	2x12	-	-	-
36	2x12	2x12	2x12	-	-	-
38	2x12	2x12	-	-	-	-
40	2x12	-	-	-	-	-
42	-	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: DOUGLAS FIR-LARCH						Double Span
Grade: #3						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x6
13	2x4	2x4	2x4	2x4	2x6	2x6
14	2x4	2x4	2x4	2x4	2x6	2x6
15	2x4	2x4	2x4	2x6	2x6	2x6
16	2x4	2x4	2x4	2x6	2x6	2x6
17	2x4	2x4	2x6	2x6	2x6	2x8
18	2x4	2x6	2x6	2x6	2x6	2x8
19	2x4	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x6	2x8	2x8
22	2x6	2x6	2x6	2x8	2x8	2x10
24	2x6	2x6	2x6	2x8	2x8	2x10
26	2x6	2x8	2x8	2x10	2x10	2x12
28	2x8	2x8	2x8	2x10	2x12	2x12
30	2x8	2x8	2x10	2x12	2x12	-
32	2x8	2x10	2x10	2x12	-	-
34	2x10	2x10	2x12	-	-	-
36	2x10	2x12	2x12	-	-	-
38	2x10	2x12	-	-	-	-
40	2x12	-	-	-	-	-
42	2x12	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Assumptions - Standard DLT Roofs

1. Span tables are provided for preliminary design estimation only. Consult MRMT for further assistance.
2. Span tables assume major axis bending only, spanning parallel to the laminations and fully supported by members perpendicular to the span direction.
3. Calculations based on NDS Supplement: Design Values for Wood Construction 2018.
4. Calculations used the following factors: CM = 1.0, Ct - 1.0, Cr = 1.15, and Cf corresponding to member size.
5. Floors use CD = 1.0. Standard roofs use CD = 1.25. For roofs with snow loads, calculations must be modified to use CD = 1.15.
6. Dead Load calculations are based on the self-weight of panel and a Superimposed Dead Load (SDL) of: **10 psf**
7. Maximum deflection is limited to 2 in. for long spans. Deflection calculations reference the modulus method of NDS Appendix F.3.1. Shear Deflections are not explicitly calculated.
8. Deflection is calculated using the following deflection limits and loading conditions: Dead Load only / Live Load only
9. Creep Deflection is calculated using 1.0DL+1.0LL and: **Kcr = 1.50** **L/180** **L/240**
10. Moment, shear, and deflection calculations are based on a design load combination of 1.0DL +1.0LL.
11. Evaluation of vibration is subjective and performance can be highly influenced by the structural system as a whole. Each project should be independently reviewed by the EOR with reference to the U.S. Mass Timber Floor Vibration Guide. MRMT span tables assume a Minimum Fundamental Frequency of 4 Hz and use the Simplified Procedures on pg. 32 of the Vibration Guide.
12. Where double span conditions are specified, the spans are assumed to be within 10% of each other. Tabulated values consider both a full and a partial live loading pattern in accordance with CBC Section 1607.13, and the maximum effects are accounted for.
13. The tabulated preliminary designs are not effected by lamination thickness; results apply for 2x, 3x and 4x laminations.
14. For simple, continuous and cantilevered bending members, span shall be taken as the distance from face-to-face of supports, plus 1/2 the required bearing length at each end.
15. Calculations are for Continuous DLT panels up to 20' in length and Finger Jointed DLT panels up to 60' in length. The above span tables do not apply to Butt Jointed DLT panels, which will have reduced spanning capacity and require project specific engineering.
16. Fire resistance calculations are not included, consult MRMT for assistance.

Span Tables

HemFir - Roof

Species: HEM-FIR					Single Span	
Grade: SELECT STRUCTURAL						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x4	2x6	2x6	2x6
14	2x4	2x4	2x6	2x6	2x6	2x6
15	2x4	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x8
19	2x6	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x8	2x8	2x8
22	2x6	2x6	2x8	2x8	2x8	2x8
24	2x8	2x8	2x8	2x8	2x8	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x8	2x10	2x10	2x10	2x10	-
32	2x10	2x10	2x10	2x10	-	-
34	2x10	2x10	2x10	-	-	-
36	2x10	-	-	-	-	-
38	-	-	-	-	-	-
40	-	-	-	-	-	-
42	-	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Double Span	
Grade: SELECT STRUCTURAL						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x4
13	2x4	2x4	2x4	2x4	2x4	2x4
14	2x4	2x4	2x4	2x4	2x4	2x6
15	2x4	2x4	2x4	2x4	2x6	2x6
16	2x4	2x4	2x4	2x6	2x6	2x6
17	2x4	2x4	2x4	2x6	2x6	2x6
18	2x4	2x4	2x6	2x6	2x6	2x6
19	2x4	2x6	2x6	2x6	2x6	2x6
20	2x4	2x6	2x6	2x6	2x6	2x6
22	2x6	2x6	2x6	2x6	2x6	2x8
24	2x6	2x6	2x6	2x6	2x8	2x8
26	2x6	2x6	2x6	2x8	2x8	2x8
28	2x6	2x6	2x8	2x8	2x8	2x10
30	2x6	2x8	2x8	2x8	2x10	2x10
32	2x8	2x8	2x8	2x10	2x10	2x10
34	2x8	2x8	2x8	2x10	2x10	2x10
36	2x8	2x8	2x10	2x10	2x10	-
38	2x8	2x10	2x10	2x10	-	-
40	2x8	2x10	2x10	2x10	-	-
42	2x10	2x10	2x10	-	-	-
44	2x10	2x10	2x10	-	-	-
46	2x10	2x10	-	-	-	-
48	2x10	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Single Span	
Grade: #1 & BTR						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x6	2x6
13	2x4	2x4	2x4	2x6	2x6	2x6
14	2x4	2x4	2x6	2x6	2x6	2x6
15	2x4	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x6
18	2x6	2x6	2x6	2x6	2x6	2x8
19	2x6	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x8	2x8	2x8
22	2x6	2x8	2x8	2x8	2x8	2x8
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x10	2x10	2x10	2x10	-	-
32	2x10	2x10	2x10	-	-	-
34	2x10	2x10	-	-	-	-
36	2x10	-	-	-	-	-
38	-	-	-	-	-	-
40	-	-	-	-	-	-
42	-	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Double Span	
Grade: #1 & BTR						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x4
13	2x4	2x4	2x4	2x4	2x4	2x4
14	2x4	2x4	2x4	2x4	2x6	2x6
15	2x4	2x4	2x4	2x4	2x6	2x6
16	2x4	2x4	2x4	2x6	2x6	2x6
17	2x4	2x4	2x6	2x6	2x6	2x6
18	2x4	2x4	2x6	2x6	2x6	2x6
19	2x4	2x6	2x6	2x6	2x6	2x6
20	2x6	2x6	2x6	2x6	2x6	2x6
22	2x6	2x6	2x6	2x6	2x8	2x8
24	2x6	2x6	2x6	2x8	2x8	2x8
26	2x6	2x6	2x6	2x8	2x8	2x8
28	2x6	2x6	2x8	2x8	2x8	2x10
30	2x6	2x8	2x8	2x8	2x10	2x10
32	2x8	2x8	2x8	2x10	2x10	2x10
34	2x8	2x8	2x8	2x10	2x10	2x10
36	2x8	2x8	2x10	2x10	2x10	-
38	2x8	2x10	2x10	2x10	-	-
40	2x10	2x10	2x10	-	-	-
42	2x10	2x10	2x10	-	-	-
44	2x10	2x10	-	-	-	-
46	2x10	-	-	-	-	-
48	2x10	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Single Span	
Grade: #2						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x4	2x4	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x6	2x8
18	2x6	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x6	2x8	2x8	2x8	2x8	2x10
24	2x8	2x8	2x8	2x8	2x10	2x10
26	2x8	2x8	2x8	2x10	2x10	2x10
28	2x8	2x8	2x10	2x10	2x10	2x10
30	2x8	2x10	2x10	2x10	2x10	-
32	2x10	2x10	2x10	2x10	-	-
34	2x10	2x10	2x10	-	-	-
36	2x10	-	-	-	-	-
38	-	-	-	-	-	-
40	-	-	-	-	-	-
42	-	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Double Span	
Grade: #2						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x4
13	2x4	2x4	2x4	2x4	2x4	2x6
14	2x4	2x4	2x4	2x4	2x6	2x6
15	2x4	2x4	2x4	2x6	2x6	2x6
16	2x4	2x4	2x4	2x6	2x6	2x6
17	2x4	2x4	2x6	2x6	2x6	2x6
18	2x4	2x6	2x6	2x6	2x6	2x6
19	2x4	2x6	2x6	2x6	2x6	2x6
20	2x6	2x6	2x6	2x6	2x6	2x8
22	2x6	2x6	2x6	2x6	2x8	2x8
24	2x6	2x6	2x6	2x8	2x8	2x10
26	2x6	2x6	2x8	2x8	2x8	2x8
28	2x6	2x8	2x8	2x8	2x10	2x10
30	2x8	2x8	2x8	2x10	2x10	2x10
32	2x8	2x8	2x8	2x10	2x10	2x10
34	2x8	2x8	2x10	2x10	2x10	-
36	2x8	2x10	2x10	2x10	-	-
38	2x10	2x10	2x10	-	-	-
40	2x10	2x10	2x10	-	-	-
42	2x10	2x10	-	-	-	-
44	2x10	-	-	-	-	-
46	2x10	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Single Span	
Grade: #3						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x6	2x6
12	2x4	2x4	2x4	2x6	2x6	2x6
13	2x4	2x4	2x6	2x6	2x6	2x6
14	2x4	2x6	2x6	2x6	2x6	2x6
15	2x6	2x6	2x6	2x6	2x6	2x6
16	2x6	2x6	2x6	2x6	2x6	2x6
17	2x6	2x6	2x6	2x6	2x8	2x8
18	2x6	2x6	2x6	2x8	2x8	2x8
19	2x6	2x6	2x6	2x8	2x8	2x8
20	2x6	2x6	2x8	2x8	2x8	2x8
22	2x8	2x8	2x8	2x8	2x10	2x10
24	2x8	2x8	2x8	2x10	2x10	2x10
26	2x8	2x8	2x10	2x10	2x10	-
28	2x10	2x10	2x10	2x10	-	-
30	2x10	2x10	2x10	-	-	-
32	2x10	2x10	-	-	-	-
34	-	-	-	-	-	-
36	-	-	-	-	-	-
38	-	-	-	-	-	-
40	-	-	-	-	-	-
42	-	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Species: HEM-FIR					Double Span	
Grade: #3						
Span (ft)	Live Load Only (psf)	Flat Roof Snow Load pf (psf)				
	20	30	40	60	80	100
8	2x4	2x4	2x4	2x4	2x4	2x4
9	2x4	2x4	2x4	2x4	2x4	2x4
10	2x4	2x4	2x4	2x4	2x4	2x4
11	2x4	2x4	2x4	2x4	2x4	2x4
12	2x4	2x4	2x4	2x4	2x4	2x6
13	2x4	2x4	2x4	2x4	2x6	2x6
14	2x4	2x4	2x4	2x6	2x6	2x6
15	2x4	2x4	2x4	2x6	2x6	2x6
16	2x4	2x4	2x6	2x6	2x6	2x6
17	2x4	2x6	2x6	2x6	2x6	2x8
18	2x4	2x6	2x6	2x6	2x8	2x8
19	2x6	2x6	2x6	2x6	2x8	2x8
20	2x6	2x6	2x6	2x8	2x8	2x8
22	2x6	2x6	2x6	2x8	2x8	2x10
24	2x6	2x6	2x8	2x8	2x10	2x10
26	2x6	2x8	2x8	2x10	2x10	-
28	2x8	2x8	2x8	2x10	-	-
30	2x8	2x8	2x10	-	-	-
32	2x8	2x10	2x10	-	-	-
34	2x10	2x10	-	-	-	-
36	2x10	-	-	-	-	-
38	2x10	-	-	-	-	-
40	-	-	-	-	-	-
42	-	-	-	-	-	-
44	-	-	-	-	-	-
46	-	-	-	-	-	-
48	-	-	-	-	-	-
50	-	-	-	-	-	-

Assumptions - Standard DLT Roofs

1. Span tables are provided for preliminary design estimation only. Consult MRMT for further assistance.
2. Span tables assume major axis bending only, spanning parallel to the laminations and fully supported by members perpendicular to the span direction.
3. Calculations based on NDS Supplement: Design Values for Wood Construction 2018.
4. Calculations used the following factors: CM = 1.0, Ct - 1.0, Cr = 1.15, and Cf corresponding to member size.
5. Floors use CD = 1.0. Standard roofs use CD = 1.25. For roofs with snow loads, calculations must be modified to use CD = 1.15.
6. Dead Load calculations are based on the self-weight of panel and a Superimposed Dead Load (SDL) of: **10 psf**
7. Maximum deflection is limited to 2 in. for long spans. Deflection calculations reference the modulus method of NDS Appendix F.3.1. Shear Deflections are not explicitly calculated.
8. Deflection is calculated using the following deflection limits and loading conditions: Dead Load only / Live Load only
9. Creep Deflection is calculated using 1.0DL+1.0LL and: **Kcr = 1.50** **L/180** **L/240**
10. Moment, shear, and deflection calculations are based on a design load combination of 1.0DL +1.0LL.
11. Evaluation of vibration is subjective and performance can be highly influenced by the structural system as a whole. Each project should be independently reviewed by the EOR with reference to the U.S. Mass Timber Floor Vibration Guide. MRMT span tables assume a Minimum Fundamental Frequency of 4 Hz and use the Simplified Procedures on pg. 32 of the Vibration Guide.
12. Where double span conditions are specified, the spans are assumed to be within 10% of each other. Tabulated values consider both a full and a partial live loading pattern in accordance with CBC Section 1607.13, and the maximum effects are accounted for.
13. The tabulated preliminary designs are not effected by lamination thickness; results apply for 2x, 3x and 4x laminations.
14. For simple, continuous and cantilevered bending members, span shall be taken as the distance from face-to-face of supports, plus 1/2 the required bearing length at each end.
15. Calculations are for Continuous DLT panels up to 20' in length and Finger Jointed DLT panels up to 60' in length. The above span tables do not apply to Butt Jointed DLT panels, which will have reduced spanning capacity and require project specific engineering.
16. Fire resistance calculations are not included, consult MRMT for assistance.

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