

### **T3 - Minneapolis, Minnesota**

T3, a seven-story office building in Minneapolis, showcases the potential of mass timber and sets a new standard for environmentally conscious construction. Designed by Michael Green Architecture and completed in 2016, T3 employs a type of engineered wood known as Nail Laminated Timber (NLT) and Glue-Laminated Timber (GLT) to create a structure that is not only visually striking, but also highly functional and efficient.

As more architects, engineers, and contractors seek out environmentally sustainable materials, wood is increasingly seen as an advantageous choice - timber is a renewable resource that sequesters carbon, rather than releasing it into the atmosphere as is the case with traditional concrete and steel structures (Green).

At T3, the use of structural timber is approximated to sequester 3,200 tonnes of carbon for the life of the building (MGA). Additionally, the use of structural timber, which is 30% lighter than an equivalent steel structure and 60% lighter than equivalent post-tensioned concrete structure, allowed for an optimized concrete foundation and stabilizing concrete core, further reducing its environmental impact (StructureCraft).

As for the timber itself, the fabrication process of NLT and GluLam involves layering wood members in specific directions to create panels that can be used as structural components. In the case of NLT, dimensional lumber is attached to the next with nails, creating a structural panel fit for floors and walls. At T3, over 1100 NLT panels were produced off-site and ranged from 10' to 40' in length (Brown). GLT, or GluLam, uses adhesives to bond layers of lumber to create structural columns (Green).

The prefabrication of these members allowed for the building to be erected more quickly and with greater accuracy, reducing the amount of time and labor needed on-site. At an average of nine days per floor, T3's timber structure was completed in 2.5 months (MGA).

Despite the many advantages of mass timber construction, it still faces several challenges in the United States. For example, there is a lack of experience and understanding among many contractors and building code officials when it comes to this technology, which can result in resistance to its widespread adoption. However, projects like T3 are a testament to the potential of mass timber technology, particularly NLT and CLT, in modern construction. The use of these materials and techniques provides numerous benefits in terms of cost, speed, and functionality, and will likely play a significant role in shaping the future of construction in the United States.

**ChatGPT prompt:**

Write a 700 word essay on T3 with a focus on the mass timber technology used, such as NLT and GLT, giving a brief explanation of their fabrication, and the structural engineering, construction timeframe, and prefabrication benefits of the T3 project in the voice of The Atlantic.

**ChatGPT essay:**

As The Atlantic, we take a closer look at the innovative mass timber technology used in the T3 building in Minneapolis. The T3 project utilized two specific materials, Nail Laminated Timber (NLT) and Glued Laminated Timber (GLT), which were instrumental in the building's success and serve as a model for future mass timber construction projects.

NLT is a type of panel that is constructed by layering thin sheets of wood and securing them together with nails. This results in a strong and rigid panel that can support heavy loads without requiring additional reinforcement. GLT, on the other hand, is created by bonding layers of wood together with adhesive. This technique results in a panel that is strong, flexible, and ideal for use in a variety of construction projects.

The use of mass timber technology in the T3 project provided several key benefits in terms of structural engineering. The panels used in the building's construction are extremely strong and rigid, which allows the building to support heavy loads without requiring additional reinforcement. This results in a lighter, more streamlined structure that is less expensive to build and requires less energy to heat and cool. Additionally, the use of mass timber also reduces the carbon footprint of the building, as wood is a renewable resource that sequesters carbon, rather than releasing it into the atmosphere as is the case with traditional concrete and steel structures.

The construction timeline of the T3 building was also impacted by the use of mass timber technology. The panels could be manufactured off-site, reducing the amount of time and labor needed on-site. The prefabrication of these panels allowed for the building to be erected more quickly and with greater accuracy, leading to significant cost savings and a reduction in the potential for construction delays.

Another key advantage of the T3 project was the use of prefabrication, which allowed for much of the building's mechanical systems to be integrated into the mass timber panels. This meant that the building was fully operational more quickly and with fewer disruptions, as the mechanical systems were already in place when the building was completed. Additionally, this approach also reduced the need for additional finishing work, as the mechanical systems were already integrated into the structure, providing a sleek and modern appearance.

Despite the many advantages of mass timber construction, it still faces several challenges in the United States. For example, there is a lack of experience and understanding among many contractors and building code officials when it comes to this technology, which can result in resistance to its widespread adoption. However, as more projects like T3 are completed, it is likely that these challenges will be overcome and mass timber construction will become increasingly common in the United States.

In conclusion, the T3 building in Minneapolis is a testament to the potential of mass timber technology, particularly NLT and GLT, in modern construction. The use of these materials and techniques provides numerous benefits in terms of cost, speed, and functionality, and will likely play a significant role in shaping the future of construction in the United States. As The Atlantic, we look forward to following the continued development and implementation of mass timber technology in the coming years

## References:

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