

INNOVATIVE WOOD PRODUCER AND VENDOR OUTREACH

Prepared for:



Prepared by:



**April 29, 2024
Draft Final Report Section**

TABLE OF CONTENTS

INTRODUCTION	3
CHAPTER OBJECTIVES	4
DELIVERABLES	4
VENDORS CONTACTED	4
FABRIC WORKSHOP	5
DESIGNERS AND BUILDERS CONTACTED	6
PROJECTS IN CALIFORNIA	7
MASS TIMBER.....	7
WOOD WOOL AND WOOD FIBER CEMENT PANELS.....	9
OTHER INNOVATIVE WOOD PRODUCTS	9
DESIGN/BUILD CAPACITY IN CALIFORNIA.....	9
OBSTACLES TO DOING BUSINESS IN CALIFORNIA	11
COST OF IWP.....	11
REVIEW AND APPROVAL PROCESS.....	11
STATE AGENCY SELECTION PROCESS.....	12
VENDOR RECOMMENDATIONS	13
CONTINUOUS INSPECTION PROCESS.....	13
VENDOR IWP INSTALLATION	13
LIMITED RESPONSE	13
TSS RECOMMENDATIONS	13
EDUCATION AND OUTREACH.....	14
BUILDING CODES AND STANDARDS.....	14
LACK OF CALIFORNIA-BASED IWP PRODUCTION.....	14
USE OF EXECUTIVE ORDERS AND GRANT FUNDING	14

LIST OF TABLES

Table 1. IWP Vendors Contacted.....	5
Table 2. Mass Timber Designers and Builders Contacted	6
Table 3. Environmental Impacts of Metal and Concrete Construction Compared to Wood.....	12

INTRODUCTION

Vendors of innovative wood products (IWP), including mass timber, wood wool cement panels, and wood fiber insulation, were surveyed to determine to what extent they have successfully marketed their products in California. Vendors were identified through searches on the internet, review of information on the Woodworks.org website and consultation with knowledgeable individuals associated with design and IWP advocacy organizations. By way of email to identified contacts or through portals on their websites they were asked the following series of questions.

- What are your primary markets in the U.S.?
- Have you faced any obstacles to doing business in California? What is the nature of those obstacles?
- If you have done business in California, what products have you sold there?
- Who are your clients in California (private sector architects/designers, engineers, construction contractors; city, county or state agencies; federal agencies)?
- How do you market your products in California?
- What can the government of the State of California do to help you improve your sales in California?

A description of the TSS research project and the role of the Joint Institute was included in the email to vendors.

In addition to sending surveys to individuals identified as sources of information regarding IWP sales, their websites were reviewed for relevant information. Returns of questionnaires sent to vendors were minimal. The reasons for this are uncertain but may include companies considering the information requested as proprietary.¹ Due to the lack of participation, the information provided in this report has primarily been obtained from the WoodWork.org website, from other websites, and from interviews with Chelsea Drenick, Regional Director of Woodworks.org.

After contacting vendors, designers and builders involved with IWP projects in California were consulted to determine what their experience was with implementing projects. These individuals and companies were identified through review of project descriptions on the Woodworks.org website.² Designers and builders were asked what criteria they used to select IWP for their projects and what, if any, obstacles they overcame in completing their projects.

¹ Chelsea Drenick, Regional Director, Woodworks.org, personal communication, April 22, 2024.

² <https://www.woodworksinnovationnetwork.org/projects/>

CHAPTER OBJECTIVES

As noted in the introduction, this section of the report provides findings generated from interviews with IWP producers and vendors and review of information on their websites. Structured interviews (defined set of questions as noted above) were conducted with targeted personnel directly involved with product marketing.

Deliverables

Deliverables from the project scope of work for Task 4 Innovative Wood Producer and Vendor Outreach are summarized below.

- Observations regarding wood product producers' and vendors' current wood product marketing experience working with California state agencies.
- Summary of wood producer and vendor concerns/perceived barriers regarding the marketing of IWP to California state agencies.
- Summary of IWP producer and vendor recommendations.

VENDORS CONTACTED

Twenty-two vendors were contacted. Of these, the following responded directly to our questions:

- Rosboro Manufactured Timber
- Hasslacher Norica Timber
- Global IFS
- RedBuilt
- TimberHP
- Sterling Structural

Despite the lack of direct responses to our questions, we found that the information on vendor websites and at the Woodworks.org website was sufficient to assess to what extent they had successfully marketed their products in California, particularly to state agencies. As a result of our outreach and review, we determined that the primary IWP that are currently used at scale in California are mass timber and wood fiber cement panels i.e., James Hardie panels used extensively for residential and commercial construction and readily available at big box outlets in California such as Home Depot and Lowes. Wood wool cement panels are also used to some extent for specialty projects such as acoustical chambers e.g., recording studios, shooting ranges and entertainment venues. We found no published examples of wood fiber insulation being used in the state, although some local applications are likely. Therefore, the main focus of this chapter is on mass timber.

Table 1. IWP Vendors Contacted

Vendor	Products	Website	Location
Eltomation B.V.	Wood wool cement panels	https://www.eltomation.com/eng/about-us/	Netherlands
Wood Wool Acoustic Panels Manufacturer		https://www.panelsforwalls.com/	China
StrandTec		https://www.asiarchitectural.com/products/strandtec/	Minnesota
Troldtekt		https://www.troldtekt.com/	Denmark
Western Forest Products	Mass timber	https://www.westernforest.com/products/	British Columbia
Mercer Mass Timber		https://mercermasstimber.com/	British Columbia, Arkansas, Washington
SmartLam North America		https://www.smartlam.com	Alabama
D.R. Johnson Lumber Company		https://www.drjwoodinnovations.com	Oregon
Freres Engineered Wood		https://frereswood.com	Oregon
Rosboro Manufactured Timber		https://rosboro.com/	Oregon
Vaagen Timbers		https://vaagentimbers.com	Washington
Nordic Structures		https://www.nordiclt.com	Quebec
American Laminators		https://www.americanlaminators.com/index.html	Oregon
Zip-O Laminators		https://zipolaminators.com/	Oregon
Hasslacher Norica Timber		https://www.hasslacher.com/	Austria
Sterling Structural		https://www.sterlingstructural.com/	Illinois
RedBuilt		https://www.redbuilt.com	Idaho
Kalesnikoff Lumber Company		https://www.kalesnikoff.com/	British Columbia
Global IFS		https://www.globalifs.com/	Michigan
TimberHP	Wood fiber insulation	https://www.timberhp.com/	Maine
James Hardie	Wood fiber cement panels	https://www.jameshardie.com/	Ireland (world-wide)
Equitone		https://www.equitone.com/	Tennessee

Fabric Workshop

Outreach to vendors included a discussion with an emerging IWP production enterprise. Fabric Workshop (FW) is a California-based group that has obtained an industrial zoned, 30-acre property located in Redding. FW expects to begin production of mass timber by late 2027. Glue laminated and cross laminated timber products will be fabricated from lumber supplied by local mills. Supply agreements are being negotiated with mills located in Trinity, Lassen, and Tehama Counties. The Chief Operating Officer of Fabric estimated the expected production capacity on the order of 100

million board-feet per year.³ This may be an over-estimate since a facility on that scale would be larger than the largest mass timber manufacturing facility in the western U.S.⁴ Other than this project, no definite examples of future IWP production at scale in California were identified. According to Chelsea Drenick of Woodworks.org, there are some smaller mill operators considering the potential for fabricating dowel joined cross-laminated timber. There is also an organization called Urban Machine using robotics to reclaim lumber that could potentially be used to create mass timber.⁵

DESIGNERS AND BUILDERS CONTACTED

Designers and builders involved with mass timber projects in California were identified through review of project descriptions on the Woodworks.org website.⁶ They were contacted to inquire about their decision making regarding mass timber as well as any issues they encountered in completing their projects (e.g., delays, costs, and availability of design and construction expertise). Some of the projects these companies were involved with included:

- University of Southern California Hub Student Housing
- U.C. Santa Cruz Kresge College Renewal
- Sonrisa affordable housing (Sacramento)
- San Mateo County Office Building No. 3
- Del Mar Civic Center
- U.C. Davis Latitude Dining Commons
- Double Ground at California College of the Arts (San Francisco)
- U.C. Los Angeles Margo Leavin Graduate Arts Studio
- Sunnydale Community Center (San Francisco)
- Caltech Resnick Sustainability Center (Pasadena)

Table 2 lists the 13 mass timber designers and building firms contacted.

Table 2. Mass Timber Designers and Builders Contacted

Designers & Builders	Services	Website	Location
TimberQuest	Mass timber designer and builder	https://timber-quest.com/	San Jose
Western Wood Structures	Mass timber engineers and builder	https://westernwoodstructures.com/clt-mass-timber/ ,	Oregon
StructureCraft	Mass timber engineers and builder	https://structurecraft.com/	Washington State
Timberlab	Mass timber builder	https://timberlab.com/	Oregon

³ Scott Ehlert, CEO and Head of Design, Fabric Workshop, Personal Communications, February 22, 2024.

⁴ Larry Swan, U.S. Forest Service (retired), personal communication, April 18, 2024.

⁵ <https://urbanmachine.build/>

⁶ Op cit.

Antunovich Associates	Architects	https://antunovich.com/about	Los Angeles
Studio Gang	Architects	https://studiogang.com/	San Francisco
Holmes Engineers	Engineers and designers	https://www.holmes.us/	San Francisco
Skidmore, Owings and Merrill	Architects	https://www.som.com/	San Francisco
Miller Hull Partnership	Architects	https://millerhull.com/	San Diego
HED	Architects and engineers	https://www.hed.design/	San Diego
Johnston Marklee	Architects	https://www.hed.design/	Los Angeles
Leddy Maytum Stacy	Architects	https://www.lmsarch.com/	San Francisco
Cannon Design	Architects	https://www.cannondesign.com/	Southern California

Of the companies listed in Table 2, the firms that directly responded to our request for information included:

- TimberQuest
- Antunovich Associates
- Studio Gang
- Miller Hull Partnership
- Cannon Design

Telephone interviews and MS Teams meetings were arranged with individuals at these companies. All information obtained during those interviews and described below is presented anonymously at the request of the individuals. In addition to these interviews, websites of these companies provided supplemental information on their experiences with mass timber projects.

PROJECTS IN CALIFORNIA

As a result of vendor outreach activities, TSS was able to confirm IWP deployment underway within California.

Mass Timber

WoodWorks maintains a list of mass timber projects throughout the U.S., cataloged by state. While not comprehensive, the list does provide descriptions of California projects. Altogether, (as of June 2023), there were 70 projects listed that are located primarily in the Bay Area and Sacramento and to a lesser extent, in Southern California.⁷

For many of the projects listed on the WoodWorks.org website, the supplier of mass timber is not listed. Those suppliers that were identified are summarized below.

- 1510 Webster, Oakland – Freres Engineered Wood, Oregon
- Orange County Sanitation District Offices – Nordic Timber, Quebec
- 10 Story Shake Table (Seismic Test) – Freres Engineered Wood, Oregon

⁷ <https://www.woodworksinnovationnetwork.org/projects/>

- MacLac Building D, San Francisco – RedBuilt LLC, Idaho
- 2100 Kettner, San Diego – Swinerton Mass Timber/TimberLab (builders), Oregon
- Westmark Lower School, Los Angeles – Western Wood Structures (fabricators/builders), Oregon
- Sunnydale Community Center – Kalesnikoff Lumber Company, Swinerton Mass timber/TimberLab, British Columbia, Oregon
- Project 1, Oakland – Freres Engineered Wood, Oregon
- Mighty Ducks Practice Facility – Western Wood Structures, Oregon
- Kind, Sacramento – Kalesnikoff Lumber Company, British Columbia
- Sacred Hearts Schools, Atherton – Kalesnikoff Lumber Company, British Columbia
- County Building #3, Redwood City – SmartLam North America, Alabama
- Church, Oakland – Western Wood Structures, Oregon
- Girl Scout Camp, Frazier Park – Freres Engineered Wood, Oregon
- Sonrisa, Sacramento – Kalesnikoff Lumber Company, British Columbia
- U.C. Santa Cruz Kresge College, Santa Cruz – Swinerton Mass Timber/Timberlab and Hasslacher Norica Timber, Oregon, Austria

Vendor websites listed in Table 1 provided additional information on projects in California. California is one of the largest markets for Global IFS flooring systems. Global IFS is in partnership with Woodworks.org to promote the use of their raised floor solutions in mass timber projects. They market their products through presentations to architects and engineers and through websites, social media, and joint presentations with WoodWorks.org. SmartLam has provided building materials for projects in Marina Del Rey, Pomona, and San Mateo County. D.R. Johnson has provided building materials for projects at Chabot College in Long Beach and for oWOW in Oakland. Vaagen Timber has supplied material to projects in San Jose, Gualala, and Irvine. Mercer Mass Timber provided building materials for the Microsoft Silicon Valley Campus in Mountain View. American Laminators has provided material for at least two projects in California, including Santa Maria and Long Beach. Rosboro distributes their products west of the Mississippi, including California, where they have provided glulam beams, columns, and decking. Their clients in California include wholesale distributors and Rosboro markets through American Institute of Architects’ continuing education classes for engineers and architects. RedBuilt LLC, (recently acquired by Hampton Lumber Company), maintains a design center in Chino, California. They do not manufacture mass timber in California. Their facility in Chino manufactures trusses. They work with designers to incorporate their trusses into mass timber projects.

Given the large number of mass timber projects completed, in design, or in construction within California, mass timber suppliers have made significant contributions to help expand the market within the state. As noted in the above listing, a few of these projects are in the public sector, but most are in the private sector. Only a few would be considered state agency projects (e.g., Sonrisa, U.C. Santa Cruz Kresge College, Chabot College, U.C. Davis Latitude Dining Center, U.C. Los Angeles Graduate Art Studios). Others are local agency projects (e.g., Long Beach Civic Center, Del Mar Community Center, San Mateo County Building #3).

Wood Wool and Wood Fiber Cement Panels

There are several manufacturers of wood wool and wood fiber acoustic panels located throughout the U.S. and in Europe and China. Troy Acoustics was formerly located in California but moved to Georgia in 2013 due to a more favorable business tax environment. They have sold and installed imported European wood wool cement panels in California for highway sound barriers (on private land), shooting ranges (indoor and outdoor), gymnasiums, animal shelters, recording studios, and sound stages. Their California clients have included county sheriff's departments, the U.S. Navy and Marine Corps, mass media and entertainment companies, and a private golf course. They have provided construction services on federal lands in California but have not completed installations for California municipalities because they do not possess a California contractor's license. They primarily market products in California via architects and engineers, but also successfully market through their website. Troy is in the pre-construction process of building a factory in Georgia that will be the first wood wool cement board factory in the U.S. The factory will produce both acoustical panels and panels that can be used for housing.⁸

According to its website, Equitone fiber cement panels have been used for projects in San Diego and Siskiyou County. Its panels are suitable for both roofing and facades.

James Hardie's website notes that they have been producing wood fiber cement panels in the U.S. since the 1980s. They are headquartered in Ireland but have a corporate office in Chicago and three building supply outlets in California. They have production facilities in several countries, including the U.S., New Zealand, Australia and the Philippines. Their products are used for siding and soffits and are replacements for stucco and wood siding. They market through retail and wholesale distributors including Home Depot, Lowes, and other building materials suppliers. One of the features attributed to wood fiber cement construction is resistance to damage from fire.

Other Innovative Wood Products

There are very few examples of IWP other than mass timber and wood wool/wood fiber cement panels being used in California, and none of these are at a commercial-scale. Experimental projects utilizing nanocrystal-infused cement and biochar have been implemented. There are no known examples of wood fiber insulation use in the state. Research on biochar infused asphalt and cement is underway at the University of Oregon and U.C. Davis. Additional research on the use of biochar for stormwater filtration and mine reclamation is being conducted by Caltrans and the California Department of Conservation.⁹

DESIGN/BUILD CAPACITY IN CALIFORNIA

It is notable that there is significant capacity in California for designing and building mass timber projects. As noted earlier in this report, there are 70 California projects described on the WoodWorks.org website. For many of these, the architects, structural engineers, and builders are identified. Although in some cases this expertise was provided by out-of-state firms, most of the

⁸ Bill Bergiadis, Founder/CEO, Troy Acoustics, personal communications, October 2023.

⁹ Elizabeth Betancourt, Natural and Working Lands policy Advisor, California Department of Conservation, personal communication, April 2024.

projects were designed and built by firms located within California. There were instances where specific expertise in mass timber construction was imported from out of state (e.g., Washington and Oregon). For example, as previously noted, Swinerton/TimberLab and Western Wood Structures were involved in some projects.

According to the WoodWorks.org website, of the 70 projects listed, there were 37 different California architecture firms involved in mass timber building design. These include firms with national or international offices such as Skidmore, Owings and Merrill, and Perkins Eastman as well as local firms such as Aedis (member of TimberQuest).

There were 20 different structural engineering firms involved with the 70 projects. John A. Martin Associates is named as the engineer in several projects. Over 15 different builders constructed the projects but six of them identified as specialists in mass timber construction (e.g., Holmes, Tomahawk Builders, W.S. Klem, Elevated Construction Services, David Mar and WEBCOR). Some projects retained specialists in building code compliance, presumably to ensure projects adhered to mass timber construction requirements.

Interviews with architects and designers indicated that those involved with mass timber construction favor its use because of its reduced embodied carbon as compared to steel and concrete, attractiveness and “biophilic” properties,¹⁰ and costs that are comparable to alternatives. Some cited ease of construction with prefabricated structural members as compared to construction with steel and concrete. Interviewees and several company websites express a commitment to zero net carbon buildings. One company was favorably impressed by the state’s emerging requirements for reduced embodied carbon in buildings (pursuant to AB 2446).

No particularly difficult construction-related issues were mentioned although in one case, structures had to be flown in to affix to vertical beams and the beams had to be temporarily stabilized until the tops were in place. Some interviewees cited benefits of mass timber construction, including lighter weight of structural elements, less concrete required in foundations, less noise during construction, less waste, and faster construction. Troy Acoustics stated that restrictions on allowing an out-of-state manufacturer to install wood wool cement panels for an end user may require hiring a local contractor who may have no experience with this type of installation.¹¹

With the exceptions noted below regarding continuous monitoring of custom glulam and cross laminated timber production and required reinforcement of CLT shear walls, no building code issues were mentioned by designers or builders. In fact, in one case, steel connectors needed to be encased with wood to protect them during a fire. This requirement acknowledged that the charring properties of mass timber provide superior protection during a fire.¹² Connectors are an issue because of the intricacies involved in joining mass timber structural elements and there are vendors who specialize in providing connectors for mass timber buildings. Two design firms indicated that they have

¹⁰ Biophilic design is a concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.

¹¹ Bill Bergiadis, Founder/CEO, Troy Acoustics, personal communications, October 2023.

¹² <https://www.woodworkingnetwork.com/news/canadian-news/new-research-confirms-mass-timbers-fire-safety-taller-buildings>

extensively used wood fiber cement panels because of their natural, stone-like appearance and/or ease of installation.

Designers and builders in California have utilized mass timber supplied by several of the companies previously listed. The main criteria used to select a vendor included production capacity and ability to deliver on time and on budget. Some of their clients required that material used for manufacturing mass timber be sourced from Forest Stewardship Council-certified forestry operations. Designers and builders prefer “package” solutions that include mass timber, connectors, and shop drawings all from the same source.

OBSTACLES TO DOING BUSINESS IN CALIFORNIA

Perhaps the greatest obstacle to use of IWP in California, specifically mass timber, wood wool cement panels, and wood fiber insulation, is the absence of California-based producers. All mass timber producers are located out of state, some as far away as Europe. The same is true for producers of wood wool cement panels and wood fiber insulation.

Cost of IWP

The cost of IWP, specifically mass timber and wood wool cement panels may exceed the cost of more conventional construction materials due to the location of suppliers outside the state of California. For example, Troy Acoustics reported that trucking costs for delivery to California have gone up exponentially, as compared to other states. Although the design/build capacity for IWP in California is robust, absence of suppliers and the need to import supplies, does influence the economics of projects. Nevertheless, some interviewees stated that building with mass timber is cost-competitive with other materials even with transportation costs. The perception of greater cost may influence the choice of materials made by a state agency (see comment by CAL FIRE representative in the Task 3 chapter).

Review and Approval Process

The outlook for marketing mass timber in Los Angeles was recently improved by the removal of the requirement for certification of building materials by the Los Angeles Department of Building and Safety (LARR certification) and acceptance of certification by the International Code Council Evaluation Service.¹³ Regarding doing business with state agencies, one vendor considered the review and approval process by the State Architect’s office to be a duplication of the requirements of the International and California Building Codes. That review only applies to projects within the State Architect’s authorities (listed below) and generally is confined to issues of accessibility. None of the vendors or designers expressed any specific difficulties working with the few state projects they were involved with except for the requirement for continuous monitoring of cross laminated timber and glulam, discussed below.

California requires continuous, on-site monitoring of cross laminated timber and glulam manufacturing at the factory by an inspector approved by the Division of the State Architect’s Office or Office of Statewide Health Planning and Development before acceptance as an allowable building

¹³ <https://www.drjcertification.org/content/7/los-angeles-changes-larr-process-isoiec-17065-accredited-process>

material for many state-sponsored projects.¹⁴ These include projects regulated by the Division of the State Architect (public elementary and secondary schools, community colleges, and state-owned or state-leased essential services buildings) and the Office of Statewide Health Planning and Development (hospitals and correctional treatment centers). This is considered a significant barrier to wider use of mass timber for those state projects since there are only a few people certified to conduct the inspections, and the manufacturing facilities are all located outside California. This essentially makes it infeasible to use European mass timber products and difficult to use mass timber from other states in such projects. At best, the requirement has caused supply chain delays.¹⁵

According to TimberQuest, another building code-related issue is the requirement for plywood reinforcement of cross laminated timber shear walls, which increases the cost of construction.¹⁶

State Agency Selection Process

Vendors did not identify any other specific obstacles to doing business in California. However, it should be noted that the issue of cost and local supply sources affects state agency choices of building materials. When costs for IWP are compared to costs of conventional materials readily available in the state, an agency architect may be compelled to select what appears to be the least cost alternative. This is unfortunate if the IWP has superior attributes in terms of the state’s greenhouse gas emissions, embodied carbon, and forest restoration objectives.

The Canadian Wood Council commissioned the Athena Sustainable Materials Institute to compare the environmental impact of wood, steel, and concrete structures.¹⁷ Athena is a non-profit organization that specializes in life cycle analysis of construction projects. The sample building that was analyzed was a 2,300 square foot single family home constructed with typical Canadian construction practices. The result of their study is summarized in the Table 3.

Table 3. Environmental Impacts of Metal and Concrete Construction Compared to Wood

Environmental Impact Compared to Wood	Embodied Energy	Negative Climate Impact	Negative Impact on Air Quality	Negative Impact on Water	Resources Consumed by Weight	Waste Produced
Metal	+53%	+23%	+74%	+247%	+14%	-21%
Concrete	+120%	+50%	+115%	+114%	+93%	+37%

The Athena study found that construction with wood in this scenario has far less negative carbon impacts than construction with steel or concrete. Another five-phase study initiated by The Nature Conservancy cites studies that indicate substituting mass timber for steel and concrete in mid-rise buildings (5-10 stories) can reduce emissions associated with manufacturing, transporting, and installing building materials by 13-26 percent.¹⁸ In addition, wood sourced from sustainably

¹⁴ Title 24, California Code of Regulations, Sections 1701.A.1.1., 1705A.5.5. and 1705.5.5

¹⁵ Matt Larson, Preconstruction Director, XL Construction (TimberQuest partner), personal communications, February 2024

¹⁶ Op cit.

¹⁷ <https://www.ecohome.net/guides/1010/how-wood-structures-compare-to-steel-and-concrete/>

¹⁸ https://repositorio.uchile.cl/bitstream/handle/2250/189557/What_is_the_impact.pdf

managed forests may have other environmental and climate benefits. With the state of California's emphasis on reducing embodied carbon in new construction, the role of life cycle analysis will increase in the future for both practical and regulatory reasons. This emphasis alone should influence the choices about construction materials made by state agencies in the future.

VENDOR RECOMMENDATIONS

Summarized below are recommendations produced as a result of vendor interviews and TSS analysis.

Continuous Inspection Process

Regarding the requirement for continuous monitoring of cross laminated timber and glulam manufacturing, vendors suggest that a better approach would be to adopt a regulatory framework for certification of production plants, similar to what is done for plywood and other engineered wood products (e.g., medium density fiberboard, oriented strand board, particleboard). Alternatively, in-plant inspectors at mills could be certified to conduct inspections. This would limit delays in fulfilling orders for California projects. Woodworks.org is working with the state to find a solution to this issue.¹⁹ Changes to code can be proposed by state agencies such as the Office of the State Architect during code revision cycles.

Vendor IWP Installation

Troy Acoustics suggests that permitting a manufacturer to install their own product for the end user would eliminate issues with finding local expertise to do the work. This would require waiving the requirement for a California licensed contractor in some cases. Woodworks.org and other organizations offer construction training for contractors that focusses on mass timber but could include construction with other IWP.

Limited Response

Other than these suggestions and issues previously mentioned, vendors, designers, and builders did not indicate that there are significant barriers to wider use of mass timber or wood wool cement panels in California. This conclusion is tempered by the fact that responses to our inquiries were limited. Lack of local suppliers of other IWP such as wood wool cement panels and wood fiber insulation limit their potential utilization in both the public (i.e., state agency) and private sectors.

TSS RECOMMENDATIONS

It is apparent that the private sector in California is motivated to utilize available IWP alternatives for construction projects for reasons including potential to create buildings that have less embodied carbon, attractiveness, biophilic properties, and comparable or superior ease of construction and lower construction cost compared to conventional materials. The lack of adoption of IWP, especially mass timber for public-sponsored construction projects is unfortunate, particularly in view of state policies promoting reduced greenhouse gas emissions, embodied carbon associated with buildings, and forest restoration goals.

¹⁹ Chelsea Drenick, WoodWorks-Wood Products Council, personal communication, March 1, 2024.

Education and Outreach

As indicated in the Task 3 section of this report, architects and engineers involved with designing and/or approving state-sponsored projects may not be well-informed about the benefits of IWP. According to the WoodWorks website²⁰ and Chelsea Drenick of Woodworks.org, educational events regarding mass timber construction are well attended by California architects and designers. In 2023, 40 such events were held and each was attended by 10-20 California designers.²¹ No information is available on how many state employees attended these events. We recommend that greater emphasis be placed on educating state employees and authorities designing and approving state buildings about the benefits of mass timber and other IWP building materials.

Building Codes and Standards

Building codes are evolving to be more accepting of mass timber for all types of buildings, including high-rise structures.²² Changes reflect increasing knowledge about the performance of mass timber structures during fire and seismic events as well as their durability and favorable carbon emissions offsets. We are not able to recommend specific changes to codes, but the Joint Institute has an opportunity to support efforts by the Building Standards Commission and other entities to change codes that encourage the wider use of mass timber. It should be noted that changes to the International Building Code in 2024 will permit greater deployment of mass timber in buildings which will enhance aesthetic qualities. Updates to the California Code reflecting these changes will likely occur in 2025.²³

Lack of California-Based IWP Production

Except for mass timber and wood fiber cement panels that are used in the private sector and may be used in some state construction projects, other IWP have not penetrated the California market, largely due to lack of suppliers. Until products such as wood fiber insulation and wood wool cement panels become economically attractive in California, they will not be utilized in either the private or public sector. Wood wool cement panels have been used to some extent for specialty projects but their potential use for structures such as highway sound barriers remains untapped.

Use of Executive Orders and Grant Funding

One last recommendation, discussed in the Task 3 section of the report, is the issuance of an Executive Order mandating consideration for the use of IWP in state projects. This tool, in conjunction with changes to grant programs administered by the state to promote use of IWP, would likely stimulate increased use of IWP and may even create an incentive to develop IWP production facilities within the state.

²⁰ IBID.

²¹ IBID.

²² <https://www.woodworks.org/learn/mass-timber-clt/tall-mass-timber/> and <https://www.woodworks.org/resources/tall-mass-timber-trends-and-exposed-timber-allowances/>

²³ Op Cit.