出國報告（出國類別：考察）

赴美參加巨積木構研討會暨參訪考察木構造建築

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派赴國家：美國

出國期間：112 年 3 月 26 日~112 年 4 月 2 日

報告日期：112 年 6 月 30 日

摘要

關鍵詞：木構造建築、CLT

美國在臺協會(AIT)農業貿易辦事處為促進木構造技術交流，邀請本所赴美參加巨積木構研討會(Mass Timber Conference)，並拜訪美國工程木材協會及參觀新近木構造建築。

本所近年來持續進行木構造設計施工技術研發及推動木構造之工法、技術及法規規範的研究與修訂，藉由本次參訪，可瞭解美國木構造發展近況及推動策略方向、相關規則規範之訂定方式，及 2021 年 IBC 建築規範修正後加入 CLT(直交集成材)應用之後續效應，以及長期使用管理維護、大地震之防災對策等議題，對我國推動木構造研議相關法令、規範研擬將有所助益。

適逢美國 IBC code 於 2021 年放寬巨木構造建築的應用，加上 2050 淨零排碳政策的推動，相信木構造建築不僅在美國，乃至世界各國正面臨一個重大變革的轉捩點。本次巨積木構研討會(Mass Timber Conference)提供一個很好的機會，從不同面向綜合瞭解美國木構造建築政策、生產、設計、營造及使用者各部門間的整體運作機制；也從實際建築物和施工中的案例，實地瞭解混合構造(混凝土構造和木構造)的應用、木構造建築結構系統設計的特性，以及結構系統和構件之間的安全關鍵所在；同時也有機會到奧勒岡州立大學，從實尺寸實驗瞭解木構造建築物耐震設計的新方法及試驗重點，這些對內政部建築研究所刻正進行的「木構造建築設計施工規範」研修工作都將有所助益。

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壹、目的

美國在臺協會(AIT)農業貿易辦事處為促進木構造技術交流，邀請本所赴美參加巨積木構研討會(Mass Timber Conference)，並拜訪美國工程木材協會及參觀新近木構造建築。

本所近年來持續進行木構造設計施工技術研發及推動木構造之工法、技術及法規規範的研究與修訂，藉由本次參訪，可瞭解美國木構造發展近況及推動策略方向、相關規則規範之訂定方式，及 2021 年 IBC 建築規範修正後加入 CLT(直交集成材)應用之後續效應，以及長期使用管理維護、大地震之防災對策等議題，對我國推動木構造研議相關法令、規範研擬將有所助益。

本次出國計畫預期效益，包括(1)蒐集美國木構造發展近況及推動策略方向、相關規則規範之訂定方式，及 2021 年 IBC 建築規範修正後加入 CLT 應用之後續效應，提供國內做為相關法規與制度研修之參考，並建立相關交流與合作聯繫之管道。(2)蒐集美國木構造長期使用管理維護、大地震之防災對策等議題資訊，作為國內推動相關木構造建築制度之借鏡及研擬建築物耐震科技研究策略之參考。

貳、過程

本次考察係由美國在臺協會(AIT)農業貿易辦事處及 APA 的規劃，瞭解近年來國際上對 Mass Timber 積極推展不遺餘力，其中又以直交集成材(Cross Laminated Timber, CLT)為最大宗，CLT 優點為強度高、預製化程度高、耐火性能佳及結構性能好，相對於混凝土可縮短施工時間及建築物重量輕。本次美國考察規劃行程由 112 年 3 月 26 日至 4 月 2 日合計 8 天，參訪行程詳如下表：

表 1 本次出國計畫行程表

日　　期	活　　動　　內　　容	備　　註
3 月 26 日(日)	啟程、抵達美國奧勒岡州波特蘭市。	臺北-波特蘭市
3 月 27 日(一)	參訪奧勒岡州立大學及參觀木構造建築(AA "Red" Emmerson Advanced Wood Products Laboratory, Peavy Forest Science Center以及Hallie Ford Center for Healthy Children and Families)，並安排和Tall Wood Institute相關研究人員交流。	美國波特蘭市
3 月 28 日(二)	參加巨積木構研討會(Mass Timber Conference)	美國波特蘭市
3 月 29 日(三)	參加巨積木構研討會(Mass Timber Conference)	美國波特蘭市
3 月 30 日(四)	參觀Great Wolf Lodge；參觀APA美國工程木材協會總部討論美國ANSI等木構規範；參觀LeMay汽車博物館。	美國塔科馬市
3 月 31 日(五)	參觀Heartwood八層樓木構公寓建築；參觀2+5層樓混合式木構建築；參觀派克市場膠合集成材拓建案	美國西雅圖市
4 月 1 日(六)	返程	美國西雅圖市-臺北
4 月 2 日(日)	抵達臺灣	美國西雅圖市-臺北

一、參加巨積木構研討會(Mass Timber Conference)

巨積木構研討會是全球最大型的木材專家會議，聚焦產業全方位的供應鏈，是在美國奧勒岡州波特蘭市舉辦的第 8 屆年度活動，主要探討直交集成材(CLT)、集成材、膠合木、巨積膠合板、非膠合集成材(DLT)及膠合板(LVL)的應用；以及全球設計、施工、開發、製造等方面的機會和障礙。

本次研討會包含 4 個重點主軸：(1)巨積木構住宅是未來的趨勢嗎？(Is Housing Mass Timber's Next Big Thing?)；(2)由學習分享過去的經驗，達到成功長期推動木構造的目標(Enabling Long-Term Success by Sharing Lessons Learned)；(3)藉由供應鏈達到地球資源利用的永續性(Sustainability Throughout the Supply Chain)：(4)消弭對於木構造預算、估價、成本和回收的迷思(Dispelling Myths Regarding Budgets, Estimates, Cost and Returns)。

本次研討會共計有60多位專家在4個重點主軸的演講，超過130家相關廠商參展，以及 2000 多位世界各地的產官學研人士與會。配合本所 112 年度執行「國際木構造建築物設計技術發展與設計施工規範檢討更新之研究」研究案，國內另有研究團隊國立臺灣科技大學蔡孟廷教授、國立高雄大學陳啓仁教授、國立成功大學教授徐宇亮教授，以及臺灣木結構工程協會楊正裕秘書長等人參與，蒐集相關資料，做為國內木構造建築物法規與制度研修之參考。此外，並有美國在臺協會(AIT)農業貿易辦事處傅文燕小姐、美國 APA 工程木材協會(The Engineered Wood Association)國際市場推廣部門主任 Charlie Barnes 先生，以及旅美資深從業技師張潤文先生協助安排行程及美國木構造建築規範說明。

圖 1 專題演講(For Whom/By Whom: Social Equity and Mass Timber)

圖 2 參展廠商現場組裝木構建築

圖 3 專題演講(Buildings of the Future: The Next Evolution of Wood)(建築師 Michael Green)

圖 4 參展廠商展示實尺寸木構建築

二、拜會相關機構

(一)奧勒岡州立大學

1-1 奧勒岡州立大學 Oregon State University (OSU)介紹

奧勒岡州立大學(Oregon State University，簡稱 OSU)是美國奧勒岡州科瓦利斯(Corvallis)的 1 所公立研究型大學，創立於 1868 年，目前約有 23,000 名學生就讀學士班，約 4,000 名就讀碩士班以及 500 名學生就讀博士班；學校共有 12 個學院，提供農業科學，公共衛生與人體科學，獸醫，環境科學，教育學，人文科學，商業與管理等領域的課程。

TallWood 設計學院(TDI)是奧勒岡州立大學(OSU)林業與工程學院與奧勒岡大學(UO)設計學院合作成立，TDI 通過應用研究、產品開發、測試和專業教育促進木結構的進步，並有 A.A. “Red” Emmerson Advanced Wood Products Laboratory，可以提供大尺寸結構測試和先進木材製造。

此次參訪，主要參觀 A. A. “Red” Emmerson Advanced Wood Products Laboratory 實尺寸 3 層木構建築試驗，並由 Arijit Sinha 教授等人實體導覽及解說，另外參觀 Peavy Forest Science Center，此 2 棟建築物皆是知名建築師 Michael Green 於 2020 完成的巨積木構建築的代表作。

1-2 實驗室參觀

圖 5 奧勒岡州立大學森林科學中心

圖 6 實尺寸 3 層木構建築試驗模型

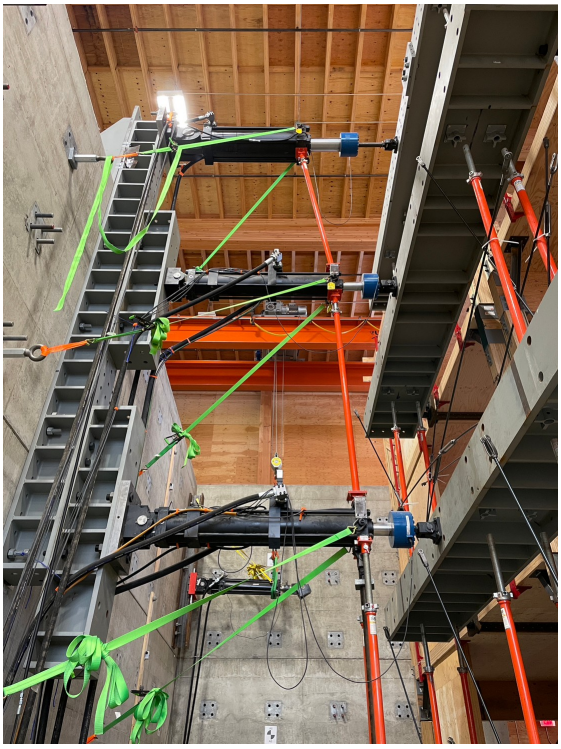


圖 7 實尺寸 3 層木構建築試驗模型以致動器施加側力

圖 8 木構建築消能裝置

圖 9 奧勒岡州立大學大型力學實驗室

圖 10 計畫主持人 Arijit Sinha 教授向來賓解說試驗細節

圖 11 討論木構建築消能裝置

圖 12 木構建築消能裝置細部

1-3 木構建築參觀

圖 13 木構建築展示中心

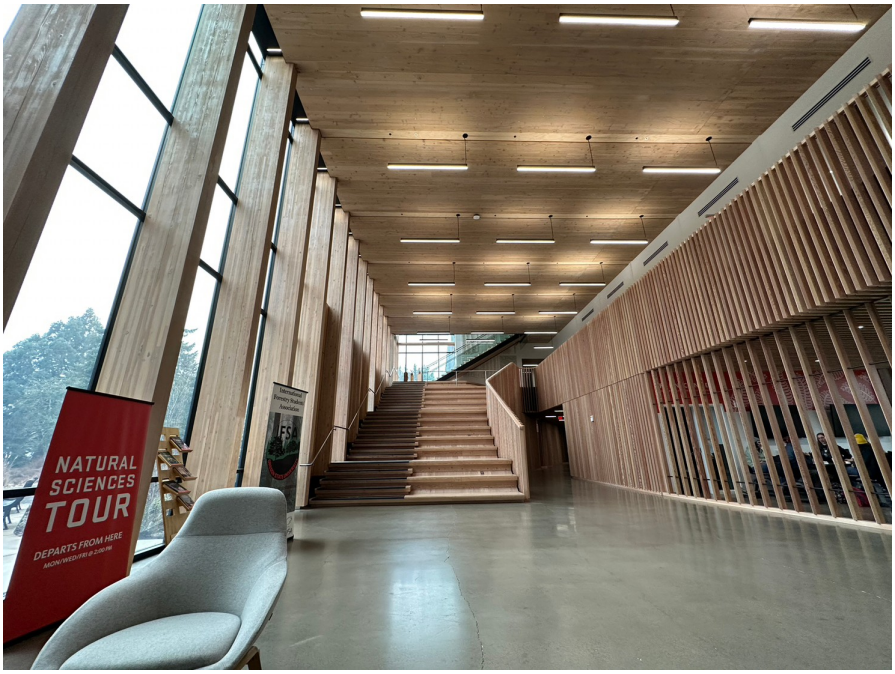


圖 14 木構建築展示中心挑高大跨度空間

圖 15 木構建築消能裝置解說牌

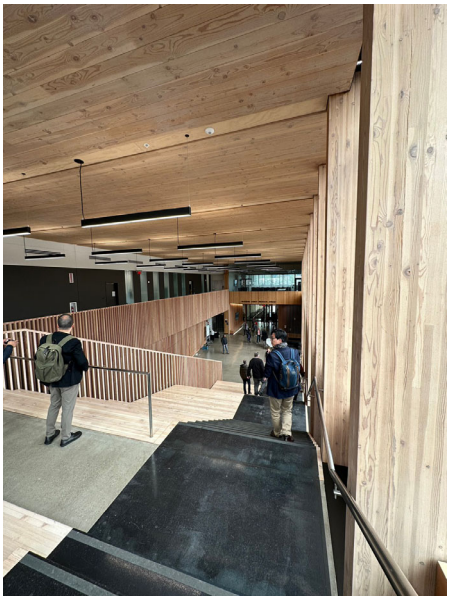


圖 16 木構建築展示中心大跨度空間

(二)拜會美國工程木材協會 APA

2-1 APA 簡介

美國 APA 工程木材協會(The Engineered Wood Association)為一非營利性、國際性的組織，1933 年成立迄今將近 90 年，總部設於華盛頓州的塔可馬市(Tacoma)，目前有 175 家會員工廠，生產北美製造的結構木板產品，及工程木材產品，其中包括集成材，直交集成材(CLT)，木材工字梁(Joist)和結構複合木材(SCL)。也是全球最大的結構工程木材產品的品質認證機構，同時被美國、加拿大、日本以及歐盟的建築法規或產品標準組織所認證，並參與多個國際標準委員會。是全球最大的結構工程木材產品的品質認證機構。

APA 主要分為三大部門，相輔相成，其主要功能：(一)技術服務(Technical Services)：美國標準、國際標準、建築法規研發、產品研究發展和測試、(二)市場營銷和研究(Marketing Services)：國內營銷、國際營銷、市場統計和研究、(三)品質服務(Quality Services)：產品認證、產品抽查、商標授予。

本所 112 年度執行「國際木構造建築物設計技術發展與設計施工規範檢討更新之研究」研究案，因此本所蔡綽芳組長特別針對國內木構造建築物設計及施工規範納入 CLT(直交集成材)應用之防火避難等問題與 APA 葉博禎博士討論。

圖 17 APA 總部

圖 18 葉博禎博士簡報 APA 情形

圖 19 與美國 APA 及 AIT 女性同仁於 APA 總部合影

圖 20 葉博禎博士與與會人員交換意見

2-2 參觀 APA 實驗室

圖 21 APA 實驗室進行板材之剪力破壞試驗

圖 22 板材之剪力破壞情形

圖 23 APA 實驗室進行木梁之撓曲破壞試驗

圖 24 APA 實驗室進行樓板之側力試驗

(三)參觀 Freres Mass Plywood Panel 工廠

3-1 Freres Mass Plywood Panel 簡介

Freres Mass Plywood Panel 是奧勒岡州首屈一指的木材製品製造商，特別強調打造優質、環保的木製產品，為開發商、建築師和工程師提供優良工程木製品。本次參訪主要著重於該工廠自動化生產設備，主因為北美木製產品市場需求龐大，且人力資源短缺，因此藉由自動化生產設備大量生產及降低成本。

圖 25 Freres Engineered Wood 公司成立超過百年(1922 年成立)

3-2 參觀 Freres Mass Plywood Panel 工廠

圖 26 工廠自動化設備(1)

圖 27 工廠自動化設備(2)

圖 28 與解說人員合影

圖 29 參觀工廠設施

三、參觀建案

(一)參觀 Rainer 建案(5+2 混合式集合住宅，DCI Engineers 公司簡報

本建案特色為底部 2 層為 RC 造，上部 5 層為木構造之混合構造建築物，國內建築法規未來是否納入混合構造建築物，尚有討論空間。

圖 30 Rainer 建案外觀(下 2 層 RC 造+上 5 層木造)

圖 31 木造 I 型小梁(Joist)

圖 32 木造建築物屋頂防水

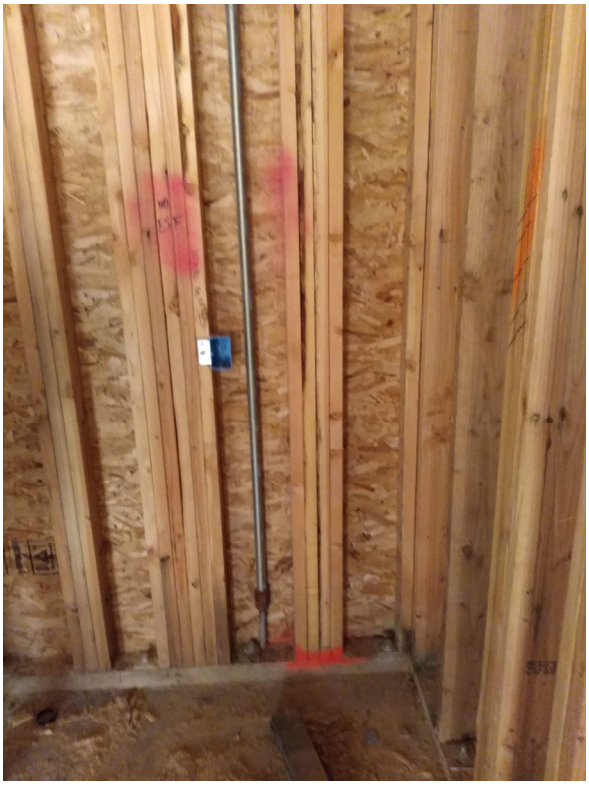


圖 33 木造建築物預埋調整螺桿

(二)參觀正在施工中的四層樓巨積木構建築

本建案特色為由木構造梁柱承擔垂直載重，而由鋼造 BRB 承擔側向載重(地震載重)，國內此種結構系統較為少見。

圖 34 本建案外觀(木造建築物搭配 BRB)

圖 35 本建案吊塔施工

圖 36 BRB 施工

圖 37 木柱與基礎轉換

(三)參觀 8 層樓的 Heartwood 木構建築(Type IV-C 大型木構)

本棟 8 層樓的建案是西雅圖市允許的第 1 個 Type-IV IBC 建築規範建築。本建案於 2021 年 4 月獲得西雅圖市的建築許可證，並於 2021 年第 2 季度開始建造。本建案與 Skipstone Development、Swinerton Construction、DCI Engineering 和 1 個統包團隊一起廣泛使用建築資訊模型(BIM)預製所有巨積木構材，並且得到美國農業部 USFS/WIG 補助款的補助。

圖 38 Heartwood 木構建築外觀

圖 39 巨積木梁柱構材

圖 40 本建案所需木材量為美國及加拿大森林 4 分鐘之生產量

圖 41 本建案可以減緩氣候變遷的衝擊

圖 42 本建案可減少 406 公噸二氧化碳的排放量

四、木構造建築實例參訪

(一)傳統木構造教堂改裝案例

這座餐廳原為歷史悠久的大跨度木構教堂，始建於 1909 年，後來轉型為當地 SteepleJack 啤酒廠的精釀啤酒廠和啤酒吧。為使其達到現代建築管理標準，拆除現有的地板系統並重新設計，同時修復已有 100 年歷史的石膏牆。大廳設有一個六角形吧台，周圍環繞著超過 24 張餐桌。其他房間都有獨特的佈局和特色。幾間最大的房間配有長桌，可容納大型團體，而較小的房間則配有豪華座椅和壁爐，可舉辦更私密的聚會。

圖 43 參訪傳統木構造教堂改裝案例

圖 44 Steeplejack 鮮釀啤酒餐廳大廳及吧台

圖 45 Steeplejack 鮮釀啤酒餐廳晚餐合影

(二)愛迪達北美總部巨積木構造辦公室

愛迪達北美總部園區的兩棟建築：一棟 1.69 萬平方公尺的辦公樓(GOLD Building 黃金大廈)和 1 座 2880 平方公尺的專業健身中心(表演區)，可以同時眺望連接兩座建築之間的足球場，以此回應本次擴建工程的核心價值觀：團隊合作、正直、敏捷、有趣，以及務實的極簡美學觀。

本案建築取得 LEED 黃金級標章，採用創新材料和施工技術，為永續性和節能設計提供新的思維。LEVER Architecture 的預鑄混凝土、膠合木集成材木梁和直交集成材(CLT)的應用，完成 1 個具有西北森林小屋溫暖質感的時尚工作場所。儘管設計植基於波特蘭市當地的文化，但 adidas 的新總部園區仍能讓我們感受關於設計的普遍性，以及對於未來辦公的瞭解和探索。

圖 46 兩座建築之間的足球場

圖 47 愛迪達北美總部辦公室

圖 48 愛迪達北美總部新建大樓

圖 49 愛迪達北美總部健身中心前說明

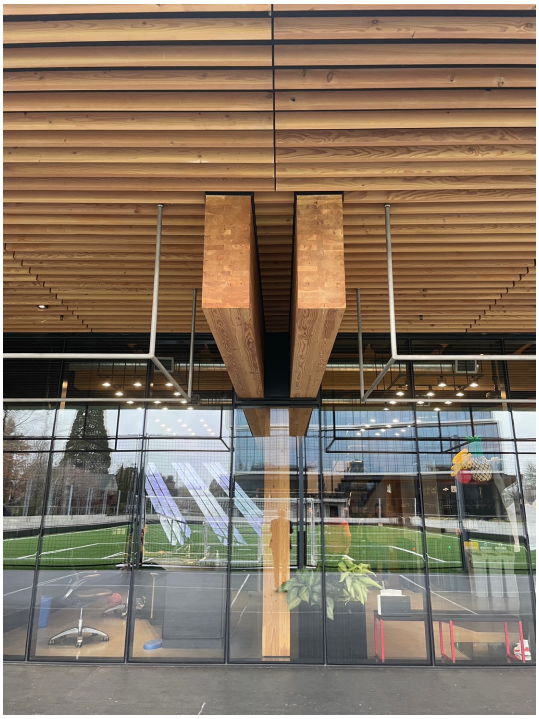


圖 50 健身中心木構造外觀

(三)傳統木構造派克市場（Pike Place Market）

派克市場位於美國西雅圖市中心的派克街，是全美國最老的農貿市場。它以販賣當地出產的農作物聞名，被稱為「西雅圖心臟」。派克市場是西雅圖最重要的觀光景點。全球最大咖啡連鎖店星巴克的第一家門店就在這個市場對面的街上。

圖 51 派克市場木構造梁柱構架

圖 52 派克市場木構柱補強

圖 53 派克市場木構件接合鐵件

(四)大跨度木構 LeMay 汽車博物館

參觀 Tacoma 市著名的 LeMay Auto Museum。該博物館位於知名的木構造體育館 Tacoma Dome 旁，博物館全館佔地 165,000 平方英呎 (15,330 m^2)，展示空間為 3.5 英畝，主要展示廳採用膠合梁構造。該博物館的目標係成為全球熱愛美國汽車的聚集地，為汽車愛好者、系列收集者及教育機構提供一個平台，展示運輸工業包括設計、技術及產品現有的成就及未來的方向，保存並宣揚汽車歷史。

圖 54 LeMay 汽車博物館正門口

圖 55 LeMay 汽車博物館內部展場

圖 56 LeMay 汽車博物館內部展場木構曲梁

圖 57 LeMay 汽車博物館展覽跑車

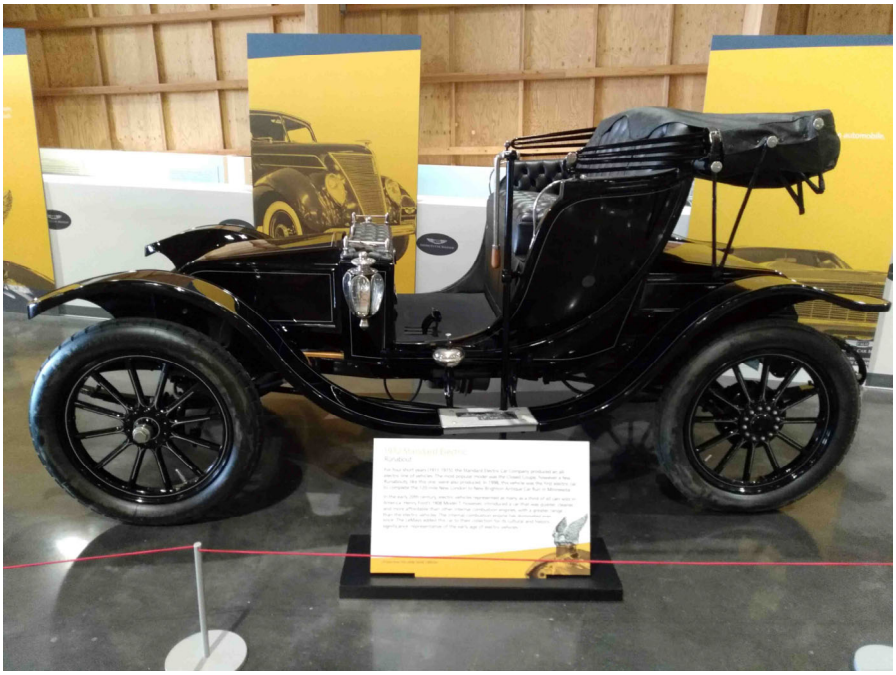


圖 58 LeMay 汽車博物館展覽舊式汽車

(五)參觀木構 Great Wolf Lodge

座落位於華盛頓州 Grand Mound，位於西雅圖市與波特蘭市之間，佔地 39 英畝的度假村包括 398 間客房、青年遊樂場、兒童遊樂區、6 間餐廳和 1 個 60,000 平方英尺的水上樂園，有 6 個游泳池和 4 個遊樂設施。30,000 平方英尺的會議中心位於超過 440,000 平方英尺的場地。本建案耗資 1.5 億美元，於 2008 年 3 月完工。用於度假村水上樂園外露的 APA EWS 膠合木，長 65 英尺，寬 8.75 英寸，深 4.5 英尺，會議中心則採用 8.75 英寸乘 18 英寸的膠合木。

圖 59 鋼柱與木梁接合細部

圖 60 大跨度木梁搭配金屬桁架

圖 61 Great Wolf Lodge 室內水上樂園

參、心得與建議

本次由美國在台協會(AIT)農業貿易辦事處及 APA 邀請本所參加巨積木構研討會(Mass Timber Conference)，並拜訪美 國工程木材協會及參觀新近木構造建築，爰有機會瞭解近年來國際上木構造建築的發展趨勢，尤其美國 IBC code 於 2021 年放寬巨木構造建築的應用，加上 2050 淨零排碳政策的推動，對 Mass Timber 積極推展不遺餘力，其中又以直交集成材(Cross Laminated Timber, CLT) ，相對於傳統木構造具有強度高、預製化程度高、耐火性能佳及結構性能好，且相對於混凝土具有施工快速、重量輕的優勢，成為 Mass Timber 的主要建材。

此外，木材是一種再生的天然資源且能降低碳足跡，人類習慣使用木材已有悠久歷史，在對木材的防腐、防蟲、防火措施日臻完善的條件下，近年來木結構建築已逐漸成為休閒設施、園林建築的新寵。隨著城市綠化建設的快速推進，加上人們對回歸自然、提高生活品質的要求越來越高，建築業界已經開始將木結構建築作為展現自然、增加建築作品附加值的首選。美國的木構造市場中，住宅(以往每年約為 1~2 百萬幢)中有 85%採用木構造，商業/非住宅有 11%採用木構造。木結構因為其外露的木材特性，能充分表現木材的天然的色澤和美麗的花紋，國內已廣泛被應用於一些崇尚自然、追求環保的建築主題中。面對未來木構造建築的發展趨勢，宜從本土應用的觀點檢視我國自然、社會環境特性，如都市密集高度都市化、位處環太平洋地震帶地震、風災頻仍等具體客觀之環境因素，綜合檢討淨零、永續、舒適、安全之平衡發展，以確保人民生活安全、產業發展及環境永續。綜合以上觀點及此次考察發現，提出以下的心得與建議：

(1)考量木構造建築防火安全，鋼構與木構或鋼筋混凝土與木構等混

合建築方式，可能成為重要的構造設計方式，未來將可就此構造之設計及施工方式研議規範，提供業界參考。

(2)直交集成材(CLT)作為新世代的建築材料已蓄勢待發，現今是國際正積極發展之新領域，建議適時引進國際成熟技術，並進一步探索防火、抗風及耐震等本土化應用議題，納入相關研究規劃，以利國內導入應用。

(3)建議本所可與 APA 等國內外單位共同辦理有關木構造建築研討會、座談會、教育訓練與推廣，以深化國內建築師、建管單位、技師、產業界與民眾對木構造建築的認識，並精進木構造建築技術。

(4)本所各實驗中心能針對木構造之防火、防風及耐震性能進行檢測與研究，除協助政府部門調合相關技術規範與標準，建議本所加強與國外相關研究機構與大學交流合作，引進最新木構造設計規定與施工技術，以提升國內木構造建築技能，增進人民居住安全。

附錄一 巨積木構研討會議程及演講者簡介

MONDAY, MARCH 27, 2023

4:00 PM – 7:00 PM

Welcome Reception

Exhibit Halls D, E

GENERAL

TUESDAY, MARCH 28, 2023

6:30 AM – 8:00 AM

Registration

Exhibit Hall C

GENERAL

+ VIEW DETAILS

8:00 AM – 9:15 AM

KEYNOTE | For Whom / By Whom: Social Equity and Mass Timber

Portland Ballrooms (Level 2)

GENERAL

*Sponsored by **Simpson Strong-Tie***

SPECIAL KEYNOTE ROUNDTABLE DISCUSSION

For Whom / By Whom: Social Equity and Mass Timber

“Oregon’s mass timber industry is at the cutting edge of sustainability and economic opportunity — helping to address the climate and housing crises while enhancing forest resiliency and creating jobs for people from rural communities, people with low incomes, and people of color”: Oregon Governor Kate Brown.

When she meets people in her work travels across the U.S., Anyeley Hallová, founder of Adre, often hears the same sentiments about Oregon’s visionary role in thinking about social equity.

This leadership in social sustainability comes in part due to the efforts Anyeley and other Portland leaders have taken in the past five years to develop buildings, public policies, funding sources, and workforce advocacy for Black, Indigenous, and People of Color (BIPOC) as well as other underrepresented groups that traditionally lack access to green business investment and ownership. As evidenced by the widespread social justice protests and activism in recent years, Portland has a deep passion for social equity making the city a fitting place for this important work.

Anyeley is a real estate developer with over 19 years of experience ranging from mixed-use sustainable housing developments to office headquarters for nonprofits, including those made with mass timber. Join Anyeley and our diverse panel of experts in a fireside chat as they discuss how to frame equity and social justice in the mass timber universe and how we can challenge the status quo as we grow this new industry worldwide.

For Whom…

Most green buildings are new buildings (Class A office space and high-end residential buildings) but the people most impacted worldwide by climate change are communities of color and lower income people. Mass timber buildings have the chance to bring resilient, biophilic design to product types such as affordable housing, schools, and spaces for people that traditionally don’t have access to green healthy buildings.

By Whom…

There are disparities in the building and environmental green movement in terms of who has been allowed to participate in these industries. The mass timber sector is our chance to build a new industry that is diverse and inclusive from the start. Equity advances in the mass timber industry can be a catalyst for change in the entire building and construction industry.

MODERATOR

ANYELEY HALLOVÁ · FOUNDER · ADRE

Anyeley started Adre in Portland, Oregon in 2020 to create a prosperous life for people and organizations that traditionally lack access to real estate ownership and investment.

Prior to Adre, she was a partner with project^ developing student housing, market-rate housing, residences, and offices for mission-driven organizations, was Development Manager for Gerding Edlen Development, and an Associate Urban Designer at EDAW.

Her civic work includes Chair of Oregon’s Land Conservation and Development Commission (LCDC) and serving on Portland’s Adjustment Committee, Community Involvement Committee for the Portland Plan, and Policy Expert Group for Residential Development and Compatibility for the Comp Plan.

She has served on the board of 1000 Friends of Oregon, Portland Housing Center, and is an expert on ULI Advisory Services Panels. She is currently serving as Chair of the U.S Green Building Council.

She is also a published researcher and writer on cultural landscapes and public consensus and is listed on a patent for Sustainable Performance Information for a Property.

The Urban Land Institute named her "40 under 40" as one of the best young land-use professionals from around the globe; the Portland Business Journal named her a "Top 40 Under 40" and "Women of Influence"; The Daily Journal of Commerce named her a "Woman of Vision"; and she has been named a Grist 50 Fixer.

PANELISTS

CHANDRA ROBINSON · PRINCIPAL · LEVER ARCHITECTURE

Chandra Robinson is a Principal at LEVER Architecture, a design practice recognized for material innovation and pioneering work with mass timber construction. Her projects encompass affordable housing, libraries, and other transformative buildings that advance social and climate justice. Chandra recently completed a LEED Platinum campus for the equity-based foundation Meyer Memorial Trust. The Meyer headquarters is one of the first buildings made using Mass Plywood Panels and implemented wood sourcing criteria for the project that supported responsible forest practices and economic opportunity for rural communities, tribal enterprises, and businesses owned by women and people of color. In addition to her civic design work, Chandra is a member of the Portland Design Commission; a Founding Board Member and Treasurer of the National Organization for Minority Architects (NOMA), Portland chapter; and on the advisory board of Hip Hop Architecture Camp.

SAM BARASO · PROGRAM MANAGER, PORTLAND CLEAN ENERGY FUND · CITY OF PORTLAND

Sam Baraso manages the Portland Clean Energy Community Benefits Fund program, or PCEF as it's known locally, which was approved by 65% of Portland voters in November 2018. PCEF invests over $100 million annually in community-led and community-driven projects focused on clean energy, transportation decarbonization, green job training, and green infrastructure. Sam brings a wealth of government experience and community leadership to the effort where he works closely with a broad range of stakeholders. Prior to his role at the City, Sam served as a senior policy advisor in Multnomah County's Office of Sustainability. Sam also serves on the State's Environmental Quality Commission and the board of Willamette Partnership. Sam holds a master's degree in environmental management from Duke University and an undergraduate in finance from Washington University in St. Louis.

TAMARA KENNEDY · DIRECTOR OF ECONOMIC DEVELOPMENT · PORT OF PORTLAND

Tamara Kennedy is the Director of Economic Development for the Port of Portland in the Trade and Equitable development division. The Port of Portland's mission is to build shared prosperity for the region through travel, trade, and economic development. In this role Tamara partners with leadership and external partners in the region to attract investment, design workforce pipeline strategies, international trade strategy and equitable development initiatives for industry clusters in advanced manufacturing and climate tech. Kennedy-Hill serves on the boards of Black United Fund of Oregon, Greater Portland Inc., NW Xcelerator and is Co-Chair of the board for Transition Projects. She holds an MBA in Nonprofit Management from the University of Portland and a bachelor's degree in Communications from Marylhurst University. Tamara's passion is to align human potential with positive community impact. She is co-founder of Portland's My People's Market, an equitable marketplace for entrepreneurs of color in the greater Portland region

NATE MCCOY · PRESIDENT & CEO · NAMC-OREGON

Nate McCoy is the President & Chief Executive Officer of the Oregon chapter of the National Association of Minority Contractors (NAMC-Oregon), McCoy graduated with a bachelor of architecture from the College of Design at the University of Oregon in 2004 and was named a "2016 Newsmaker" by the Daily Journal of Commerce. Prior to joining NAMC-Oregon, McCoy spent seven years as a senior construction coordinator for the Portland Housing Bureau and Portland Development Commission (now Prosper Portland), including work in the private sector at GBD Architects before launching into the public sector. Nate serves on the board of the Architecture Foundation of Oregon to promote awareness and support career opportunities for the next generation with an aim toward minority and underrepresented youth in communities of color. He has also spent seven years on the appointed advisory commission for the Portland Housing Bureau helping to shape policies and outcomes related to affordable housing, contracting equity, and workforce development.

- COLLAPSE

9:15 AM – 10:30 AM

Networking Break with Refreshments

Exhibit Halls D, E

GENERAL

+ VIEW DETAILS

10:30 AM – 12:00 PM

Home is Where the Start is: Mass Timber in Single Family Houses

D Meeting Rooms: 137–140

TRACK 1

*Sponsored by **Sansin***

Mass timber use in single family homes has always been something of an enigma. The vast majority of product development and production is focused on much larger scale projects. This panel will showcase a few examples of current efforts to utilize mass timber in single family home design and construction and explore both the future opportunities and current challenges to increasing the applications of mass timber in this market.

Moderator:

Jennifer Bonner · Director, MALL / Associate Professor of Architecture, Harvard University Graduate School of Design

Presentations:

After the Dixie Fire: Building Hardened Homes for a Hardened Community using CLT

What to do after a town burns in a wildfire? Build fire hardened homes using cross laminated timber. This presentation discusses the pathway Sierra Institute for Community and Environment is pursuing to help rebuild the town of Greenville and get people back into homes and businesses after the devastating Dixie Fire. Fifteen months after the Dixie Fire, Sierra Institute has worked with partners including Mass Timber Strategy, altelierjones, Harriott Valentine Engineers, DR Johnson Wood Innovations, Lights Creek Construction, Plumas County, among others, and has erected one- two- and three-bedroom mass timber homes. A fourth model is being developed and all plans are available for residents to use for rebuilding. More mass timber homes will be built in 2023. We're also using mass timber to rebuild the Roundhouse Indian Education Center. Building fire hardened structures is an essential part of rebuilding in high hazard forested areas and a key part of building hardened communities.

Jonathan Kusel · Executive Director · Sierra Institute for Community and Environment

Jonathan Kusel is founder and executive director of the Sierra Institute for Community and Environment. He received a Ph.D. in Natural Resource Sociology and Policy from U.C. Berkeley, where he taught before launching the Sierra Institute in northern California. He holds a Masters in Forest Science from the Yale School of Forestry and Environmental Studies. Dr. Kusel helped lead a team evaluating community and social implications of climate change in the Sierra as part of California's 4th Climate Assessment. In 2018, Dr. Kusel led a team that built a small biomass-powered energy facility for rural Plumas County's Health and Human Services Center. The facility is housed in the first full cross laminated timber building constructed in California. The 2021 Dixie Fire burned through the Sierra Institute's home community, destroying much of the town of Greenville. Working with partners, Sierra Institute is now building single-family CLT homes to help residents who lost homes in the Dixie Fire and pilot home and community hardening using mass timber. Launching in 2023, Sierra Institute is a convener for California's Community Economic Resilience Fund planning in the ten-county North State region of California.

Burj Zanzibar and the Implementation of Timber Construction in East Africa

Burj Zanzibar will become the tallest hybrid timber building in Africa. The groundwork to make this project possible has started many years ago with the construction of a new urban center south of Zanzibar City. This new settlement envisions a sustainable way of living starting with the construction of the buildings themselves. Over the past years through the implementation of various buildings, different forms of timber technologies have been explored in both design and construction. With the experience gather through these projects and the exchange between international and local parties, we have gradually created the local knowledge and craftsmanship to evolve from simple wood stud constructions, used for the equitable Moyoni homes, to more complex engineered timber solutions implemented for the middle-market Vizazi houses. The combination of local resources and the strategic import from engineered timber components overseas have allowed for a cost-effective delivery of timber buildings in the East-African context. The Burj Zanzibar aims, as a new iconic building for Zanzibar, to highlight this development to promote the further development of a local production framework for engineered timber products making use of the vast timber resources available on the East African highlands.

Leander Moons · Architect · OMT architects

Leander Moons founded his design studio Leander Moons Inc in 2019 in New York. With to the fast growth of the project portfolio he established, together with Andreas Trampe-Kieslich, OMT architects GmbH in Berlin in 2021. Both companies work seamlessly together from the concept design phase through the project delivery on site. They aim to create and im¬plement sustainable, equitable and empowering design solutions and build projects. The integration of locally resourced and sus-tainable building materials, with a special focus on timber, are the focal point in the most recent projects. Before establishing his own businesses, Leander worked for leading architectural offices in Europe (Baumschlager Eberle Architects), Africa (Bowman Architects Associates) and North America (nbbj design). Leander supervised the Berlin office of Baumschlager Eberle Architects and the Nairobi office of Bowman Architects and has been leading international consultant teams for complex projects around the globe. He contributed to the realization of numerous projects worldwide and his works have received multiple architectural awards. Leander Moons Inc and OMT architects GmbH are creating innovative solutions based on local practices and recourses. In addition to their sustainable character, flexibility in use and implementation is a key contributor to the success of the projects.

Building Your Dream Home With Mass Timber

For this presentation I'll discuss some of the pros and cons of building a residential home with mass timber. I am proud to say that Vaagen Timbers has been a part of numerous mass timber home projects. From tiny to large we have been able to lock elbows with design teams and get these projects across the finish line. There are some hurdles that everyone will encounter along the way. Things like finding the right design team, to finding the right builder, to making sure that you are using mass timber where it makes sense. Lots of pitfalls come up and it's just a matter of preplanning and looking at the project from a holistic view. Thankfully, we have found success in the residential market and I'm looking forward to discussing that during this presentation.

Tom Baun · Regional Business Development Manager · Vaagen Timbers

Tom Baun is the Regional Business Development Manager at Vaagen Timbers. He has been with the company since the doors opened in March of 2019. He has been a part of over 90 mass timber projects ranging from commercial (office, multi-family, and hotels) to residential and specialty boutique projects. Tom grew up on a Farm just outside of Colville enjoying all the things that the forests of northeast Washington have to offer. He, along with longtime friend Russ Vaagen, were Colville High School graduates. After college, Tom and his wife (Lori) returned home to Colville to raise their three boys. When Russ offered Tom the opportunity to be able to be the part of the Vaagen Timbers Team, Tom never looked back. Recently, Tom and Lori were able to build their mass timber forever home. Tom says: "I will drink the Kool-Aid that I'm selling. I wanted to experience what it was like to be a customer and I needed to make sure that I saw things from that perspective. Tom is deeply rooted in the Community and is also involved with groups like Montana Mass Timber Rising, AIA functions, and the International Mass Timber Conference produced by Forest Business Network.

- COLLAPSE

10:30 AM – 12:00 PM

Policy, Incentives, Finance, and Market Development: How To Stimulate Mass Timber's Growth

D Meeting Rooms: 135–136

TRACK 2

Moderator:

Sandra Lupien · Director, MassTimber@MSU · Michigan State University

After working in the non-profit and public sectors for nearly two decades, Sandra Lupien caught the mass timber bug while pursuing a mid-career climate-solutions-focused Master of Public Policy at University of California, Berkeley. Her thesis, which explored ways California could remove the barriers to the manufacture and adoption of mass timber in order to create climate-smart markets and end-uses for "low-value" dead and green trees from over-dense California forests, ultimately led Sandra to her position as Director, MassTimber@MSU. Immediately before joining Michigan State University in July of 2021, Sandra served as Deputy Director, External Affairs and Communications, in the California Governor's Office of Planning and Research/California Strategic Growth Council (appointed by Governor Gavin Newsom). Through MassTimber@MSU, Sandra collaborates with MSU faculty; stakeholders in government, the AEC, real estate development, and forest products industries; and anyone else who is game to harness research, education, outreach and engagement, and policy to advance sustainable mass timber construction and manufacture in Michigan and the surrounding Great Lakes Region. She is always happy to talk about the mass timber momentum building in Michigan. Sandra is proud to serve on the 2023 International Mass Timber Conference Committee.

Presentations:

An Overview of the Financing Environment for Mass Timber

Eric will discuss IFG's view on the financing environment for mass timber with a focus on strategies to finance early-stage growth through plant construction, plant expansion, and multi-plant rollouts, as well as the importance of the larger mass timber supply chain. Eric will address the importance of the mass timber ESG-story as it relates to sustainable forest management, fire mitigation, carbon sequestration, and the emerging state of carbon credits. Eric will cover the current state of mass timber projects across North America leveraging data from Woodworks and other industry groups to highlight the accelerating demand for mass timber construction that is increasing the need for mass timber manufacturing capacity and driving demand from a more diverse landscape of capital providers with an increased appetite to participate in financing the expansion of the North American mass timber industry.

Eric Edwards · Managing Partner · IFG Asset Management

IFG Asset Management is a boutique Investment Banking Advisory, Merchant Banking, and Asset Management platform with a focus on the private Real Assets sector and has been actively engaged in advising the Mass Timber industry since 2016. IFG pursues a unique strategy where it serves as a trusted advisor in a variety of transactions, including debt & equity capital raises and mergers & acquisitions, while also looking for opportunities to co-invest in our clients for long-term value-add and

alignment of interests. IFG is proud to serve as exclusive financial advisor to Colville, Washington-based Vaagen Timbers. Eric Edwards is a Managing Partner of IFG and leads the Firm's Investment Banking Advisory and Merchant Banking activities where his primary responsibilities include due diligence, underwriting, structuring, and originating transactions. Eric also has responsibility for the Firm's existing portfolio investments which require routine interactions with portfolio company management, board of directors, co-investors, and other stakeholders.

From Niche to Mainstream: BC's Mass Timber Action Plan

Launched in April 2022, British Columbia's Mass Timber Action Plan will leverage this new construction technology to maximize benefits for people, the economy, and the climate. This Plan builds on BC's reputation as an early mover and innovator in wood-based building construction. What role can a government play to accelerate the transition of mass timber building construction from the niche activity it is today to a mainstream one? How can actions be mobilized across departments to ensure the whole of all actions is greater than the sum of individual parts? How does good governance impact this emerging sector's growth through a combination of leading, following and sometimes just getting out of the way? Jarrett Hutchinson is the Executive Director of BC's newly created Office of Mass Timber Implementation. This Office has been established as a leadership hub to coordinate and leverage authorities and responsibilities across BC's provincial government to advance the Plan. He will describe the impacts the Plan is having and what work is still needed as BC continues to position itself as a leading mass timber friendly jurisdiction.

Jarrett Hutchinson · Executive Director · Office of Mass Timber Implementation, Province of British Columbia
Jarrett Hutchinson is the Executive Director of the Office of Mass Timber Implementation with the Province of British Columbia on the west coast of Canada. He has been instrumental in advancing the use of mass timber. Highlights include creating the Building Code that allowed the 18-storey Brock Commons student residence at the University of British Columbia in 2015, and more recently, developing B.C.'s Mass Timber Action Plan which was released in 2022. Throughout his career, Jarrett has held leadership roles in the development, application and enforcement of codes, standards and built environment policies locally, provincially, nationally and internationally.

Financing Mass Timber Projects Through Insured Carbon Offsets

This presentation will illustrate how AEC firms and builders can help finance mass timber projects by utilizing insured carbon offsets**.** Aureus Earth is dedicated to monetizing the built environment's ability to combat climate change. In September 2022 Aureus Earth and the University of Washington complete the first carbon offset transaction based on mass timber construction. Utilizing a technical steering committee of embodied carbon experts in the built environment, Aureus Earth developed the world's first Mass Timber Building Carbon Offset Methodology, which was then piloted in partnership with the University of Washington's new Founder's Hall**.** The presentation will highlight this ground-breaking transaction, explain the benefits of mass timber-based offsets, and outline program eligibility requirements for new building projects.

Sal Barnes · CEO and Co-Founder · CEO and Co-Founder
Salmeron (Sal) Barnes is Cofounder and CEO of Aureus Earth (AE). Aureus Earth is accelerating decarbonization in the construction industry by reducing the existing green premium between the cost of traditional building materials and low-carbon and carbon-storing alternatives. The company offers a groundbreaking portfolio of financial instruments that incentivizes the use of climate-positive building materials in large-scale commercial, institutional, and residential construction. Together with our industry partners, Aureus Earth creates and monetizes building-based carbon offsets for use in carbon offsetting or carbon insetting programs. Based in Boulder, Colorado, Aureus Earth is led by a multidisciplinary team of experts in engineering, materials science, resource development, and corporate strategy consulting.

- COLLAPSE

10:30 AM – 12:00 PM

Forestry: Inventory, Management and Wildfire: Making Sense of It All

E Meeting Rooms: 141–144

TRACK 3

*Sponsored by **Nordic Structures***

Moderator:

Mark Wishnie · Chief Sustainability Officer · BTG Pactual Timberland Investment Group*Mark Wishnie is Chief Sustainability Officer at the BTG Pactual Timberland Investment Group (TIG). Mark is responsible for sustainability across the firm's global timberland portfolio and leads the firm's climate-focused investment practice. Mark joined BTG from global non-profit The Nature Conservancy, where he led the organization's Global Forestry & Wood Products program. Previously, Mark served as head of portfolio management, analytics, and research at TIG, co-founded and served as Managing Director of Equator, LLC, a timberland and environmental commodity investment company, directed a joint research program of the Smithsonian Institution and Yale University focused on tropical forest restoration, and served as Program Director of the Yale Tropical Resources Institute. Mark's research has been published in journals such as Sustainability, Forest Ecology and Management, Conservation Biology, and The Annual Review of Anthropology.*

Mark holds a BS in Forest Management from the University of Washington and a Master of Forest Science from Yale University.

Strategic Monitoring of the Nation's Forest Resources

Did you know that the Forest Inventory and Analysis (FIA) program of the USDA Forest Service has been monitoring the status and trends of the nation's forests since the 1930s? This information is collected across all ownerships on an annual basis, and the results are regularly distributed to land managers and policy makers. Published documents and online reports interpret the rich database, and online tools are available for the general public to explore their own interests in detail. This session will review recent insights from this strategic inventory with a focus on trends relevant to the mass timber community.

Hobie Perry · Research Program Manager · USDA Forest Service

Hobie Perry is a program manager for Forest Inventory and Analysis (FIA) program in the USDA Forest Service. Hobie collaborates with peers, users, partners, and stakeholders to guide the development, implementation, and delivery of the nation's "forest census." This inventory monitors the status and trends of the nation's forest resources through an extensive field campaign and surveys of forest landowners and mill operators. Hobie previously served as National Program Leader for Monitoring, Remote Sensing and Geospatial Analysis Research, led his unit's Analytical Science Group, and conducted the program's soil indicator. His passion for maps led to an assignment as the lead for the program's Digital Engagement Portfolio, an effort to transform how FIA stores, analyzes, and shares information and knowledge. These responsibilities included the privilege of serving as an adviser to governments, corporations, and nongovernmental organizations on inventory and analytical visualization. Hobie has Ph.D. and M.S. degrees in forestry from the University of Minnesota and a B.A. in philosophy from the University of Michigan. Does a tree falling in the woods make a sound? Let's discuss it! Prior to joining the Forest Service, Hobie spent five years on the faculty of Humboldt State University (Arcata, CA) teaching wildland watershed management.

Yakama Forest Management: Building Partnerships, Reaching Common Goals

Yakama Reservation, located in southcentral Washington State, is home to the Confederated Tribes and Bands of the Yakama Nation. The estimated 1.4-million-acre Reservation consists of 650,000 acres of forest that historically provided and continues to provide economic, ecological, and cultural resources for the Yakama people. This presentation will highlight Yakama Nation Forest Management and the Tribe's effort in building partnerships with other forest land management agencies to achieve common goals.

Tia Beavert · Tribal Forest Manager · Yakama Nation Tribal Forestry

Tia Beavert is a member of the Confederated Tribes and Bands of the Yakama Nation. She worked as a Presale Planner for Yakama Nation Branch of Forestry for seven years and became the Tribal Forest Manager in 2019. She currently oversees Yakama Nation Tribal Forestry which consists of Fire Management, Fuels, Forest Development, Fee Land Forestry, Off-Reservation Collaborations, and Mount Adams Tract-D Recreation. Tia has a Bachelor of Science in Biology and Environmental Science (Heritage University), studied Forestry as a post-baccalaureate student (Oregon State University), has a Graduate Certificate in Sustainable Natural Resources (Oregon State University), and is member of the Advisory Council for the Women's Forest Congress.

Wildfire Crisis: Mass Timber can Help!

Wildfires have been growing in size and severity in the past 20 years, impacting our forests and communities. The USDA Forest Service, with other agencies, Tribes, states, communities and landowners are focusing efforts on reducing wildfire risk. Wood products and their markets play an important role in supporting fire-resilient forests, and the Forest Service has strategically invested in over 150 mass timber projects since 2015. This presentation will focus on the real options for the supply chain — from developers to mass timber producers — to engage and support forest resilience and reduced wildfire risk. Mass timber innovations and markets can support our forest health, while also sequestering large quantities of carbon. Join us to discuss your role in supporting forest management.

Brian Brashaw · Assistant Director · USDA Forest Service

Brian Brashaw is the Assistant Director for the USDA Forest Service, State & Private Forestry, Wood Innovations Program. The Wood Innovations Program supports the development of wood products and wood energy markets to reduce wildfire risk and enhance long-term, sustainable management of America's forests. Wood Innovations has helped the entire mass timber sector grow and expand through 150+ federal grant investments in manufacturing and buildings, education and building project assistance, special communication initiatives, and technical assistance. Wood Innovations focuses on building markets for wood products, working collaboratively and strategically to advance forest products markets to support sustainable forest management, carbon-storing building materials, and economic development. For over 30 years, Brian has focused on supporting the connection between forestry and forest products, helping support and advance wood products through research, market development and outreach. Brian earned a BS degree in Forestry from the University of Wisconsin–Stevens Point, a MS degree in Wood Materials Engineering from Washington State University, and a PhD in Forest Resources from Mississippi State University.

- COLLAPSE

10:30 AM – 12:00 PM

Optimizing Design and Keeping Costs in Check: Secrets from the Manufacturers

E Meeting Rooms: 145–146

TRACK 4

*Sponsored by **TallWood Design Institute***

Moderator:

Heather Strong · Western Senior Director · WoodWorks

Heather is a licensed Professional Engineer in the State of California, and received her BS in Civil Engineering from California Polytechnic State University at San Luis Obispo. Prior to joining WoodWorks, she spent 13 years working in the wood industry with a focus on the use of wood in commercial applications. She has led teams in both the areas of design and technical support. She has a strong background in team mentoring, leadership and reporting. Before that, Heather spent five years in the United States Navy followed by four years in the California Air National Guard.

Presentation:

Roundtable Discussion | Optimizing Design and Keeping Costs in Check: Secrets from the Manufacturers

Have you ever wondered what makes an efficient, constructible connection for mass timber projects? Is there an ideal grid size to limit cost? Is it better to have two narrow girders or one that's wider? At what phase of design is it best to bring the manufacturer on-board? In this roundtable discussion, three manufacturers reveal their design and detailing secrets to achieve the most economical structure possible, as well as their tips and lessons-learned to optimize and improve the resulting cost per square foot.

Michaela Harms · Senior Director of Mass Timber · Sterling Structural

Michaela Harms has co-written and managed nearly $3M in USDA grant funded research focused on mass timber construction and small-diameter utilization. She specializes in business development, strategy, standards compliance and engineering within the forest products and sustainable construction sectors. Her prior experience includes leading the R&D/Strategy department for a structural round and heavy timber manufacturer, serving as the engineered wood products and sustainable forestry expert for an international certification body and managing algorithm and business development for construction life cycle assessment software. Her work has been published in Structures Magazine and in 2021 she presented to Wisconsin State Government officials, making the case for mass timber building code updates to support Wisconsin's woodland economies. She currently serves as Senior Director of Mass Timber at Sterling Structural, a division of North America's largest CLT manufacturer. Michaela holds a degree in Civil Engineering focused on Sustainable Building from Metropolia University of Applied Sciences, Helsinki, Finland.

Andre Lema · Manager of Business Development · Western Archrib

Andre Lema is the Business Development Manager at Western Archrib. He has spent his career in the wood industry starting as a carpenter before attending NAIT in Construction Engineering. He spent 10 years in the wood truss business before joining Western Archrib in 1995. Current duties as Manager of Business Development requires working in the early project stages with builders, developers, architects, and engineers. He enjoys a wide variety of outdoor activities particularly in the mountains and usually has a woodworking project on the go.

Another panelist announced soon.

- COLLAPSE

12:00 PM – 1:15 PM

Break and Exhibitor Appreciation

Exhibit Halls C, D, E

GENERAL

+ VIEW DETAILS

1:15 PM – 2:45 PM

3 Projects, 3 Scales: Ways To Make Mass Timber Housing Truly Affordable

D Meeting Rooms: 137–140

TRACK 1

*Sponsored by **Sansin***

Moderator:

Iain Macdonald · Director · TallWood Design Institute

Iain Macdonald is the founding Director of the TallWood Design Institute, a position he has held since 2016. He has worked in business development, training and research management roles in the forest products industry for 23 years, prior to which he was involved in export marketing of building products to Asia Pacific markets. Macdonald led the Centre for Advanced Wood Processing (CAWP) at University of British Columbia, Canada (UBC) for nine years, during which time he was involved in pioneering efforts by the Province of British Columbia to stimulate and support mass timber industry development. Iain holds degrees in marketing and professional education. He has significant experience globally in the design and delivery of technical and business education to workplace and professional learners, and in creating programs to stimulate innovation, entrepreneurship and business development. He is a director and past chair of Canada's Wood Manufacturing Council.

Presentations:

Roundtable Discussion | Heartwood Type IV-C Middle Income Housing in Seattle, Washington

Heartwood is the first mass timber middle income housing project to be constructed in the United States. At completion, (May, 2023) it will have 126 units of housing in 8 stories of Type IV-C construction (67,000 SF). Project feasibility was established through a USFS Wood Innovations Grant that allowed the team to perform preliminary design and initial pricing. The project is being built for a non-profit owner, Community Roots Housing, but is financed without public funding (commercial construction loan and Opportunity Zone equity). The design-build project team included people who already had deep relationships and who remained committed to mutual success through the challenges of COVID and remote work. The project has substantially advanced the development of details and construction strategies that can be replicated on other projects.

Susan Jones · Founding Architect · atelierjones

Susan Jones, FAIA is an architect with over 30 years of experience and is the lead architect of Heartwood. Founder of the award-winning architectural Seattle firm, atelierjones focuses primarily on designing and building lower-carbon, mass timber buildings. With eight completed mass timber projects, atelierjones is a national leader. atelierjones, a solely woman-owned architectural firm, designs tall and mid-rise, multi-family mass timber housing, as well as mass timber institutional buildings and single-family houses. Susan regularly partakes in national and international leadership-level collaborations to create change at scale and ensure rigor on multiple levels, from forest health to LCA studies, to fire testing, including a multi-year commitment to write and pass new national 2021/2024 ICC Tall Wood Building Codes.

William Silva · Director of Preconstruction · Swinerton

William Silva is a seasoned construction veteran who manages all aspects of design and preconstruction management for Swinerton Builders in Portland, Oregon. A graduate of Oregon State University with a B.S. in Construction Management, William has over 30 years of well-rounded experience throughout the West Coast markets, having worked both in project development and self-perform heavy civil, concrete, and mass timber operations. William joined Swinerton in 2004 and returned to the Pacific Northwest in 2014. He is a passionate advocate for mass timber buildings with a knack for finding efficient and eloquent solutions to project challenges, having applied those skills to successfully deliver numerous projects.

A-P Hurd · President · Skipstone

A-P Hurd's 25-year career spans real estate, finance, and technology. She is the former President of Touchstone, one of the largest private development firms in Seattle. Under her leadership, Touchstone successfully delivered 2M SF of real estate (10 projects) with institutional capital partners such as Principal
Real Estate Investors, USAA, and AIG. During her tenure, Touchstone also won the national Developer of the Year award. Since founding SkipStone in 2017, A-P has supported clients such as the City of San Jose — helping them negotiate a development agreement with Google and Lendlease for 7M SF of office and 6,000 units of housing and has worked on other TOD developments on the West Coast. A-P serves on several corporate boards in Seattle and Vancouver, Canada.

Using Mass Timber to Build Zero-Carbon Workforce Housing

With their most recent development project — "Star Lofts" in Des Moines, Iowa — Scott and Molly set out to bring Iowa its first Zero Carbon building (as certified by the International Living Future Institute). True to their business mission, the Cutlers wanted the building to be both Zero Carbon and offer 100% of units at affordable/workforce housing rental rates, as a blueprint to prove that sustainable housing and affordable housing don't have to be mutually exclusive**.** No strangers to mass timber, Scott and Molly again used the material to achieve their embodied carbon reduction targets on the project. Join them for this presentation about why they are using mass timber in workforce housing across the Greater Des Moines Metro and how they are changing the local private and public perspective on achieving sustainable goals through commercial real estate development.

 **Scott & Molly Cutler · Managers · Cutler Development**

Scott and Molly Cutler run Cutler Development, a commercial real estate company in Des Moines, Iowa. Their company's mission is "to develop projects that better neighborhoods, society, and the environment." They have completed several mixed-use new construction and historic renovation projects across the state of Iowa, including most recently Iowa's first mass timber building to feature residential housing. At the beginning of 2023 they broke ground now on their second mass timber building, the details of which will be discussed further in their presentation. Scott has over 15 years of industry experience with commercial development including specific experience with historic renovation, affordable housing, and environmental design. He started Cutler Development in March 2016. Molly is a chemical engineer by degree and joined Cutler Development in March 2021, after almost 10 years in various leadership roles across manufacturing, business development, data analytics, and market development at ExxonMobil. Scott and Molly enjoy working together on projects and continue to push the boundaries of environmental design on both new construction and renovation projects. They live in Des Moines where they enjoy volunteering, attending art exhibitions, cycling, and traveling.

Sonrisa Downtown – on the Forefront of CLT

Sonrisa is the first project under Governor Newsom's Executive Order N-06-19 for Affordable Housing Development, which directs the development of affordable housing on excess State-owned sites and the pursuit of sustainable, innovative, and cost-effective construction methods. Sonrisa is a five-story Type IIIB building with 58 LIHTC-regulated affordable apartments, majority of which are 270 SF microunits. A key goal with Sonrisa was creating a high quality, affordable, compact living environment. Sonrisa used CLT for the horizontal components (i.e. 1st fl. ceiling/2nd fl. floor, and so forth). Part of the design aesthetic has been taking advantage of the single layer of CLT floor/ceiling and going with a "guts out" approach of showing the organized conduits and pipes**.** While there were many cost increases for implementing the novel CLT system, the immeasurable benefits of environmental sustainability paired with the exposed warm wood and significantly higher ceiling height made it a no brainer. Sonrisa is the first ground-up CLT project in Sacramento, and was developed through a public-private partnership between the Capitol Area Community Development Corporation (CACDC) and CFY Development. CACDC is the nonprofit arm of the Capitol Area Development Authority (CADA), a joint powers authority between the City of Sacramento and State of California.

 **Renee Funston · Development Manager · Capitol Area Development Authority**

Renee Funston is a project manager with CADA in Downtown Sacramento. In addition to managing affordable housing developments, Renee oversees the disposition and development of other State-owned sites and manages streetscape projects in the central city. CADA is a unique public agency created in 1978 to foster and maintain housing that is accessible for a wide range of income levels and bolster the vitality of the urban 24-hour community around the State Capitol. Renee has been working in responsible land use since 2015. She holds a MS in Urban Land Development, and was an urban planner in her past life.

- COLLAPSE

1:15 PM – 2:45 PM

Avoiding On-Site Delays and Disruptions

D Meeting Rooms: 135–136

TRACK 2

Moderator:

 **Brandon Brooks · Mass Timber Construction Management Program Manager · WoodWorks**

Brandon is an experienced project and program manager. He has previous experience in government test and evaluation efforts for acquisition projects with congressional oversight, created an education and training roadmap for several technical skills programs, and was fortunate enough to lead and work alongside some of our country's greatest people in the Marine Corps. He obtained a Bachelor of Science in Business Administration with a focus on finance from the University of Florida, completed his MBA at Virginia Tech, and is a Project Management Professional. He is based in Anchorage, Alaska.

Presentations:

Mass Timber Builder Essentials

This presentation will focus on the "5 Mass Timber Essentials" that we have developed over our many years of mass timber construction:

- Manage pre-construction time
- Model everything
- Optimize details
- Integrate MEP systems early
- Execute a moisture management plan

I will provide specific examples and key lessons learned associated with each of these 5 key topics.

Brad Nile · Project Executive · Andersen Construction

As an Architect, lifelong builder and student of construction systems, Brad Nile has made timber construction the focus of his academic studies as well as world travels. In his 28 years with Andersen Construction, Brad has managed the construction of many landmark buildings in Portland, Oregon, and well as the seismic upgrading of dozens of occupied facilities. His work as a mass timber builder includes high-profile projects at Oregon State University, the University of Washington, Portland Community College, and downtown Portland.

Successful Moisture Management

Water, especially as precipitated during construction phase, is enemy #1 for the long term success of not only individual mass timber building projects, but the entire industry. Schedule savings and even carbon calculations go out the window without managing bulk water well. A consensus among some has been: "budget for remediation." Not only do I think the mass timber industry can do better, with numerous design, industry, and academic partners, we have proven it is possible to avoid costly moisture damage. With gravel and orphaned fasteners caked in our boots, this visually engaging presentation will bring you along for the ride. Through project success stories, R&D failures and refinements, we will share the latest technology, techniques, and details which have been effective for avoiding construction delays due to often gambled, punted, or overlooked moisture management strategies. North America's wet and varying climates provide a set of challenges unique and different than that of much of the European continent and other maturing markets. Effective solutions for successful moisture management are a collaborative effort. They require project-appropriate, clear plans, specifications (we will touch on divisions 1, 6, and 7) and contracts which employ constructible, durable, safe, cost-effective, and dryable systems.

Aaron Gould · Head of Sustainability · VaproShield

Aaron Gould has over 20 years of international experience in design and construction, with a focus on health and durability. After several seasons of guiding climbing, whitewater, and mountaineering, while gaining proficiency as a carpenter/tradesman, he went on to lead and found design, construction, and consulting businesses. He is currently enjoying his 10th year with VaproShield, of Gig Harbor, Wash., heading up sustainability globally. Examples from his project CV, include experience on: mass timber, hospitals, hotels, high rises, mixed use, net zero developments, government facilities, art museums, historic restorations, schools/universities, and the occasional tree house. Recent speaking engagements include: University of Miami School of Architecture, Auburn University CLT Symposium, RDH's New England Mass Timber, AIA Regenerative Design Summit, and more. He currently lives outside of Chattanooga, Tenn., with his wife and children. Aaron's professional focus centers on fostering a spirit of collaboration with amazing people to achieve resilient, regenerative buildings. "If a building leaks, it is not sustainable." Aaron is a member of: Clemson University WU+D, WMF, IIBEC, NIBS/BEC, ABAA, RAiNA, TVOS, Build ReUse, and Green|Spaces.

Leveraging Virtual Construction for Complex, Passive House, Prefabricated Mass Timber Structures: ON5 and 1 Lonsdale Case Studies

Joe Geluch and Robert Malczyk will bring the perspective of the Builder, Structural Engineer, and owner while presenting the tools, approaches, and execution procedures used in their recent collaboration of two completed mass timber Office projects in Vancouver, British Columbia. Highlighting a collaborative, Virtual Construction process, with early contractor involvement, that has resulted in the progression of off-site construction prefabrication and an extremely fast structural and building enclosure. They will discuss the lessons learned on two completed projects and highlight the many innovations applied to mass timber construction including:

- TS3 Structural Gluing innovation allowing for flat slab CLT construction with no columns or beams
- Execution of Fully Clad CLT Envelope Facade Panels built off-site and to Passive House standards
- Tectonus self-centering seismic structural hold downs
- Passive house challenges and successes in mixed-use, mass timber projects
- Innovative use of VDC integrated with a unique contract delivery model

Joe Geluch · President · Naikoon Contracting

Joe Geluch, RSE, P.GSC is the President and CEO of Naikoon Contracting Ltd. an award-winning, vertically integrated Construction Manager that specializes in digital project delivery and execution of complex mass timber projects. Over the past 13 years as President of Naikoon, he has gained expertise in many different aspects of both commercial and residential construction and led his teams through almost 100 projects and to over 40 industry awards, locally, provincially, and nationally. He is a Red Seal Carpenter, a Gold Seal Project Manager, and a Certified Housing Professional who has spent over 22 years in the industry. He is a founding member of Canada's Net Zero Energy Housing Council, past CHBA BC Executive Board of Directors, Technical Research Committee (past chair), and current chair of the BCIT Carpentry Advisory Committee.

Robert Malczyk · Principal · Timber Engineering

Robert Malczyk, MaSc, P.Eng., Struct.Eng, MIStructE, MBA, Principal of Timber Engineering Inc., has over 25 years of experience. Robert is a long-standing member of the O86 "Engineering Design in Wood" code committee, and an original member of the recently formed ANSI/APA PRG 320: Standard for Performance Rated Cross-Laminated Timber code committee and NRC's Task Force in Mid-Rise Design. Robert has designed numerous award-winning, architecturally oriented building structures in all major building material, with a particular expertise in timber engineering. These

include many with high sustainability requirements. They include the Renewable Energy Demonstration Project (Biomass Gasification Plant) at the University of British Columbia in Vancouver, the Centre of Excellence for Clean Energy Technology (CECET) and WindMill Training Tower at the Northern Lights College in Dawson Creek, BC, and two trade training centers for the College of New Caledonia, in Prince George and Quesnel, BC. Robert also has completed numerous post-secondary and institutional buildings including the University of Massachusetts Integrated Design Centre in Amherst, and the University of Arkansas Adohi Hall.

- COLLAPSE

1:15 PM – 2:45 PM

Manufacturing Mass Timber: Streamlining and Optimizing Resource Use

E Meeting Rooms: 141–144

TRACK 3

*Sponsored by **Nordic Structures***

Moderator:

Brian Brashaw · Assistant Director, Wood Innovations · USDA Forest Service

Brian Brashaw is the Assistant Director for the USDA Forest Service, State & Private Forestry, Wood Innovations Program. The Wood Innovations Program supports the development of wood products and wood energy markets to reduce wildfire risk and enhance long-term, sustainable management of National Forests and other forest lands. Wood Innovations has focused on mass timber, innovative wood products and renewable wood energy through grants to support education and building project assistance, special communication initiatives, and technical assistance. This team works collaboratively and strategically to advance forest products markets to support sustainable forest management, carbon-storing building materials, and economic development. For over 30 years, Brian has focused on supporting the connection between forestry and forest products, helping support and advance wood products through research, market development and outreach. Brian earned a BS degree in Forestry from the University of Wisconsin–Stevens Point, a MS degree in Wood Materials Engineering from Washington State University, and a PhD in Forest Resources from Mississippi State University.

Presentations:

Resource Utilization and Optimization in Mass Timber Manufacture

This presentation will provide a historical overview of the layup configurations used in Glued-Laminated Timber (Glulam) and Cross-Laminated Timber (CLT) – as they related to the visual and mechanically-graded lumber used to manufacture the structural elements. The author will provide a clear description and better understanding of the grading methods used in Glulam and CLT, and will discuss the pathways necessary to (1) pursue improved or innovative new layups, (2) to utilize locally-harvested species of structural lumber, or (3) implement modern Lumber Grading Methods that will improve production capacity and maximize resource yields.

Roland Hernandez · Vertical Market Manager – Mass Timber · Stiles Machinery – National

A 30+ year career in Mass Timber that has included Research Engineer/Wood Scientist at the USDA Forest Products Laboratory; Engineered Wood Specialist for APA – The Engineered Wood Association; Product Manager for Bell Structural Solutions, a division of the ALAMCO Wood Products Glulam Manufacturing Plant. Now assisting the Mass Timber Industry as Vertical Market Manager in Mass Timber for Stiles Machinery — introducing Mass Timber manufacturers to the Best-In-Class machinery solutions for increasing their production, improving their efficiency, and embracing innovation.

Seedlings to Solutions: Efficient Resource Use in Mass Timber Manufacturing

In this presentation Melissa Kindratsky and Mitch Warren will discuss the mass timber manufacturing process with a focus on efficient mass timber design to match the available products and resources. With over 80 years of experience as land managers and wood products manufacturers, Kalesnikoff's integrated approach seeks to take care of the land and bring the most value to every log. During this presentation Melissa and Mitch will touch on forest management, log procurement, sawmilling, lumber recovery, mass timber manufacturing, early engineering and architectural decisions, connection design, fabrication, and tips for reducing scope gaps.

Melissa Kindratsky · Head of Engineering · Kalesnikoff

With almost 20 years of practicing as a structural engineer, Melissa leads Kalesnikoff Mass Timber's Engineering Department. Her experience in structural consulting means she deeply understands the whole building design process but is happiest when focusing on Mass Timber. She thrives in design-assist roles, helping make Mass Timber structures efficient in material use, manufacturing, and during construction. She particularly enjoys the critical details that bring together a whole structure, specifically the connections. When she's not working with forest products, she can be found playing in the forest either on her mountain bike or skis.

 **Mitch Warren · Mass Timber Sales Manager · Kalesnikoff Mass Timber**
Mitch's enthusiasm for mass timber grows out of his passion for stewardship. As one of the first team members to join Kalesnikoff Mass Timber, Mitch has been involved in various aspects of the company's growth including forestry certification, product certification, business development, estimating, and project delivery. His breadth of experience ranging from the first truckload of glulam to hundreds of successful deliveries across North America makes Mitch a valuable resource to the team at Kalesnikoff and their partners.

BIM Modeling and Its Role in Efficient Manufacturing

Bernie Krey and Chelsea Olson will discuss the role of BIM modeling as a collaboration tool through all stages of a mass timber project, and how it can affect the efficiency of a project. This presentation will review ways in which BIM modeling can streamline a project from the perspective of different stakeholders, including the base building design team, construction team, fabricators and installers. Opportunities for a more efficient project workflow will be discussed as well as some common inefficiencies, scope gaps and project delays and how these can be overcome with modeling.

 **Bernie Krey · Senior Mass Timber Technologist · ISL**
Bernie brings over 20 years' experience in mass timber fabrication to ISL's buildings team. His expertise includes BIM modeling, estimating and design for manufacturing and assembly (DfMA), 3D modeling, CAD/CAM drafting, project management and CNC beam processor programming and operation. He has experienced firsthand the evolution of the mass timber industry over the past two decades, and sees the benefits of improved coordination through BIM modeling, striving to incorporate new processes into each modeling project for efficient project delivery.

 **Chelsea Olson · Structural Engineer / Mass Timber Specialist · ISL**
With over a decade of experience in structural engineering, building science and restoration, Chelsea's primary role involves projects with a focus on mass timber construction. With a Master of Engineering in Integrated Wood Design and consulting engineering experience at design firms throughout Western Canada, her expertise includes both the design of base building structures as the Engineer-of-Record, and specialty engineering design of mass timber components and connections. At times, she has the opportunity to fulfill both roles on the same project, enabling her to create details that bring the building together in an efficient and architecturally expressive way. Working closely with ISL's in-house modeling team, Chelsea gets to see the direct benefits of a coordinated project workflow through the use of BIM modeling.

- COLLAPSE

1:15 PM – 2:45 PM

Insurance and Financing for Mass Timber Projects: Relationships and Knowledge Are the Key

E Meeting Rooms: 145–146

TRACK 4

*Sponsored by **TallWood Design Institute***

Moderator:

 **Ricky McLain · Senior Technical Director · WoodWorks – Wood Products Council**
Ricky is WoodWorks' in-house expert on tall mass timber buildings, providing analysis and guidance on architectural, fire and life safety, and structural design topics. He supports the AEC community both directly and collaboratively with WoodWorks Regional Directors, and guides the development of education and resources related to tall mass timber buildings in the U.S. Prior to this emphasis, Ricky's role encompassed all building types and wood systems. He also has extensive experience in lead engineer roles related to structural design, project management and construction administration. Ricky is Executive Director of the Structural Engineers Association of Vermont, and a member of numerous committees and councils related to building design.

A Roundtable Discussion

In order for a mass timber project to be successful — and in order to pave the way for future success and growth of the industry — key project stakeholders beyond just AECD must be engaged and brought on board. To date, challenges have persisted with securing insurance and financing for some mass timber projects. Is this entirely due to lack of experience, lack of data and testing, lack of risk appetite, lack of insurance capacity, some combination of the above, or due to yet-to-be explored topics? The number of mass timber projects in the US and throughout the world continues to grow at a steady rate; are these projects not facing the same challenges, or are they finding a way to move beyond them? How are these challenges being addressed internationally, and what can we learn from solutions emerging with global underwriters?

This interactive and engaging session brings six key stakeholders together with extensive mass timber experience to a joint discussion on the topics of insurance and financing. The unique perspectives of architect, developer, insurance broker, insurance underwriter and capital markets provider in this session will address common questions and explore new topics on how the industry can collectively advance on these fronts. Andrew Waugh will share how architects and insurers are working together in the London market to find commonly-agreed upon details and design concepts to ease the burden on future projects. Sheldon Opperman, Nate Helbach and Mike Brady will share their first hand experiences from securing insurance and financing from two of the tallest mass timber buildings in the world: Ascent in Milwaukee and Baker's Place in Madison**.** Brian Burg and Mark Gadaire will share insights from the insurer perspective, addressing why challenges exist, how capacity limits factor in, what designers and contractors can do to proactively lessen hurdles, and what factors will influence the direction of the insurance industry on mass timber construction. With a mix of short presentations, structured panelist dialog and open audience Q&A, this panel will provide valuable insights for anyone who has encountered, is encountering, or will encounter insurance and financing challenges on mass timber projects.

 **Brian Burg · Senior Director – Real Estate & Hospitality Practice Leader · MWR Gallagher**

Brian leads the Real Estate & Hospitality Practice for Gallagher's Midwest Region. He has experience in placing insurance for large mass timber projects throughout the United States.

 **Mark Gadaire · Senior Vice President · Chubb Group**

Mark has more than 30 years experience as a loss control representative, underwriter and underwriting manager concentrating on construction exposures. Mark currently manages the New York/Philadelphia Major Accounts Inland Marine Region and serves as Major Accounts Builders Risk Product Practice Leader for the United States. He holds a Bachelor of Science degree in Civil Engineering from the University of Lowell, MA and has completed the advanced training courses offered by Swiss and Munich Re.

 **Nate Helbach · Managing Partner · The Neutral Project**

Nate Helbach is a Managing Partner at The Neutral Project, a sustainable real estate development company. The Neutral Project has a primary goal to redefine the conventional real estate development model that perpetuates endless growth and disregards environmental or societal impact. The Neutral Standard is an initiative to implement the company's thesis to build carbon-neutral mixed-use and multifamily developments that eliminate embodied carbon emissions and minimize operational carbon emissions. The standard's primary competitive advantage is its ability to portray the carbon story. This is done by performing multiple iterations of a project life cycle analysis (LCA) and energy model. The LCA indicates how much-embodied carbon the project will use during construction relative to a code-compliant building, and the energy model forecasts how much operational carbon will be used during the life of the building. Our company maxim is to leave this world a better place than we found it, and we believe that building to the Neutral Standard will facilitate our pursuit. The Neutral Project is actively developing two mass timber multifamily towers and has several mass timber multifamily developments in the pipeline.

 **Mike Brady · Director · JLL Capital Markets**

Mike Brady is a Director in JLL's Chicago Capital Markets Group. A member of JLL's Capital Markets ESG Council, Mike and his partners advised on the construction financing for both Ascent and Bakers Place. These two transformative projects brought tall mass timber multifamily construction to the State of Wisconsin.

- COLLAPSE

2:45 PM – 3:30 PM

Networking Break with Refreshments

Exhibit Halls D, E

GENERAL

+ VIEW DETAILS

3:30 PM – 4:30 PM

FIRESIDE CHAT: Are We There Yet? Carbon, Construction & Credibility.

Portland Ballrooms (Level 2)

GENERAL

*Sponsored by **Business Oregon***

Grab a cup of coffee and a snack, sit back and relax. Gather in the ballroom for a powerful discussion with some of the top minds and companies using mass timber to build a better world.

Are We There Yet? Carbon, Construction & Credibility.

The compliance and voluntary carbon markets doubled in value worldwide between 2020 and 2022, and billions of dollars followed their lead by investing in related technologies. But this period also saw

growing and persistent calls for higher quality carbon offsets instruments and stricter standards for verification and monitoring of carbon claims.

This evening's fireside chat panel assembles international leaders helping pinpoint key barriers to the transformation of the construction industry, accelerate adoption of innovative construction products, and inform public perceptions of the credible role that forests, forest management, mass timber and other construction innovations can play shaping our carbon future.

MODERATOR

MICHAEL GOERGEN · VICE PRESIDENT, INNOVATION · U.S. ENDOWMENT FOR FORESTRY & COMMUNITIES

Michael Goergen joined the Endowment in September 2013 to lead their efforts in innovation and new markets. He works on commercializing cellulosic nanomaterials, advancing mass timber construction, providing accurate carbon information on forests and wood products, and bringing together partners in the public and private sectors to accelerate the development of new uses of forest materials. Before joining the Endowment, Michael was Executive Vice President and CEO of the Society of American Foresters (SAF). He graduated from the SUNY College of Environmental Science and Forestry where he received a Bachelor of Science degree in Environmental Policy and Management and a Master of Science degree in Forest Resource Policy and Management.

PANELISTS

AMANDA STURGEON · CEO · BUILT BY NATURE

Amanda Sturgeon, FAIA is the CEO of Built by Nature, a network and grant-making fund dedicated to creating buildings that work in unison with nature. Previously, as the Regenerative Design and Climate Change Practice Lead at global consultancy firm Mott MacDonald, she brought regenerative design solutions to city scale projects across Australia and the Asia Pacific region. As the former CEO of the International Living Future Institute, she spent a decade creating regenerative frameworks such as the Living Building and Community Challenge programs, scaled the organization globally and created a global movement around Biophilic Design. Amanda is an award-winning architect, author of Creating Biophilic Buildings, a TED Speaker on Bringing Biophilic Design to Life and has an essay in the anthology All We Can Save: Truth, Courage and Solutions to Climate Change. In 2015 she was named as one of the top 10 women in sustainability with the Women in Sustainability Leadership Award and was elevated to a Fellow of the American Institute of Architects in 2014.

WEKESA GEORGE · MASS TIMBER LEAD · BUILD X

Wekesa is a Kenyan licensed architect, Autodesk Tech Leadership Development fellow, Quality of Life and wellbeing champion and the mass timber lead at BuildX. He has worked on projects focusing on alternative building technology to advance environmentally conscious materials, affordable healthcare, and socially responsive design solutions. As Mass Timber Lead he is overseeing the development of BuildX's flagship mass timber building in Kenya. He is the primary representative and advocate for mass timber, internally and externally, in Kenya and East Africa, focused on building and managing key stakeholder partnerships. Through this, he will steer the long term transformation of the construction market towards a sustainable mass timber economy working collaboratively with the design, impact, and real estate development teams to ensure BuildX delivers on its own goals as it seeks to develop pioneering mass timber buildings in Kenya.

More panelists announced soon.

- COLLAPSE

4:30 PM – 6:00 PM

Reception

Exhibit Halls D, E

GENERAL

+ VIEW DETAILS

BACK TO TOP

WEDNESDAY, MARCH 29, 2023

6:30 am – 8:00 am

Registration

Exhibit Hall C

GENERAL

+ VIEW DETAILS

8:00 AM – 9:00 AM

KEYNOTE | Buildings of the Future: The Next Evolution of Wood

Portland Ballrooms (Level 2)

GENERAL

*Sponsored by **Skanska***

SPECIAL KEYNOTE PRESENTATION

Buildings of the Future: The Next Evolution of Wood

MICHAEL GREEN · ARCHITECT AND FOUNDER/PRINCIPAL · MGA

Taking the design and construction industries by storm with his groundbreaking TED Talk, “Why We Should Build Wooden Skyscrapers,” Michael Green launched the very first International Mass Timber Conference as our inaugural keynote speaker in 2016.

Michael has since traveled the globe lecturing on sustainable design and materials, led research and education initiatives in climate, environment, disaster, and global shelter needs, and designed some of the most significant timber projects in the world.

Now, back from climbing one of the world’s most sought-after peaks, and inspired by the beauty — and demise — of our natural environment, Michael returns to the conference to talk about the next evolution of wood construction.

Join us as he takes us again to unknown heights with a new approach that could change the nature of our built environment — and our future.

ABOUT MICHAEL

Michael Green is an award-winning architect, speaker, and author known for using design to create meaningful, sustainable built environments that benefit both people and planet. A leader in wood construction and innovation, he has completed some of the most significant timber buildings in the world, and has been recognized with over forty international awards for design excellence, including the Royal Architectural Institute of Canada Firm of the Year, Architizer’s Best in North America Firm Award in both 2021 and 2022, four Governor General’s Medals, two RAIC Innovation Awards, and the American Institute of Architects Innovation Award.

Michael is a Fellow of the Royal Architectural Institute of Canada and the recipient of an honourary doctorate degree from the University of Northern British Columbia. He serves as a government policy advisor on mass timber design and is the co-author of the first and second editions of The Case for Tall Wood Buildings *and* Tall Wood Buildings: Design, Construction and Performance.

- COLLAPSE

9:00 AM – 10:30 AM

Networking Break with Refreshments

Exhibit Halls D, E

GENERAL

+ VIEW DETAILS

10:30 AM – 12:00 AM

Bearing Walls, Beams or Columns? Engineering Solutions for Multi-Family Mass Timber

D Meeting Rooms: 137–140

TRACK 1

*Sponsored by **Sansin***

Moderator:

Ilana Danzig · Associate Principal · Aspect Structural Engineers

Ilana is an Associate Principal with Aspect Structural Engineers. With 15 years of structural engineering experience, she has worked in all materials but has a particular passion for mass timber design and seismic engineering. She has worked on a wide range of iconic projects in Canada and the US including the Oregon State University College of Forestry, the UBC Aquatic Centre, the Audain Art Museum, and the innovative District 56 Tallwood 1 and Terminus mass timber buildings in Langford, BC. Ilana also has a wealth of experience in off-site prefabricated mass timber and light wood frame systems, as well as construction engineering for mass timber buildings. Ilana began her career in Vancouver, BC working mainly on institutional projects, recreational facilities, and seismic retrofits. She obtained a Master’s in Structural Engineering from the University of British Columbia studying dynamics, seismic design, and mass timber structures. Her research focused on mass timber engineering in high-seismic zones, particularly connections for CLT diaphragms and shearwalls. Ilana believes in a collaborative and creative approach to design and problem solving, and is an enthusiastic mentor to others.

Presentations:

SuperBungalows: Successful Use of Mass Timber in Multifamily Construction

This presentation will review a multifamily housing project constructed in Los Angeles using cross-laminated timber (CLT) panels and light frame wood walls. Pros and cons of the system in high-seismic zones will be explained and future uses of the light-frame hybrid system will be evaluated.

Matt Timmers · Principal · John A. Martin and Associates

Matt Timmers has served as Principal-in-Charge for a variety of large-scale and complex projects. His experience spans a broad range of typologies and sizes including lab buildings, educational structures, residential facilities, mixed-use, hospitality, sports facilities, museums, specialized retail, office buildings, and civic centers. He is seasoned at proposing and evaluating optimal structural systems to meet budgets, schedules, and design goals, all informed by a commitment to sustainable approaches and systems. Matt served as Structural Work Group Chair for the ICC Ad Hoc Committee on Tall Wood Buildings that developed and passed the 2021 IBC Tall Timber Code Provisions.

Optimization of Mass Timber Framing for Residential High-Rise Projects

Josh will speak about the process of optimizing mass timber floor framing while considering strength, serviceability, fire, connections, and MEP coordination. With a combination of digital tools and field experience, it is important to consider all the project goals early and iterate them efficiently as project parameters evolve.

Josh Dortzbach · Principal / CEO · Forefront Structural Engineers

Josh Dortzbach is the CEO and co-founder of Forefront Structural Engineers, a structural engineering firm focused on creative technical solutions that are balanced in the science, art, and practical application of the built world. He is also Principal and co-founder of Interstice, LLC, an applied research company to fuel his work as EOR by focusing on filling the gaps between engineering, development and construction logistics by merging computational workflow and real-world application. His past background as a trade carpenter influences the way that he designs and communicates. Josh is the Structural Engineer of Record for various mass timber projects, including the Cleveland INTRO project which is the largest volumetric mass timber project in North America.

Point-Supported Mass Timber in High-Rise Multi-Family Developments to Address Housing Crisis in Densely Populated Regions

Housing continues to be a national crisis as demand exceeds supply, particularly in dense, urban city centers. Mid-to-high-rise multi-family developments are the best solution to provide housing to a large number of families while taking up the least amount of real estate. Traditionally, high-rise multi-family developments have defaulted to concrete construction due to code limitations for buildings of those heights and floor-to-floor height limitations requiring thin structural assemblies.

One promising alternative to flat-plate concrete construction is point-supported mass timber. The 2021 IBC introduced new provisions specifically for mass timber, among them being three new construction types permitting mass timber buildings up to 270-feet. Eliminating beams from the structural system allows for viable living spaces that do not compromise the floor-to-ceiling heights within the residential units.

Instead, the mass timber floor panels span in two directions, supported only at column locations. Because this structural system has previously only been used in Europe and Canada, testing must be done in the U.S. to validate the adequacy of this system.

This presentation will go into detail of the design and analysis approach used for point-supported mass timber structures, including how finite element models were used, connection details, and in-situ testing results.

Robin Landis · Senior Engineer · Holmes

Robin is a Senior Engineer based in San Francisco with international engineering firm Holmes. Her 10+ years of experience is spread across all market sectors and material types. In the last four years, she has been particularly involved and dedicated to the advancement of mass timber construction in the United States. Robin is pioneering structural applications of new wood systems in national and local markets focusing on the implementation of the premier point-supported CLT system. This effort is backed by her extensive research and testing in partnership with the REACTS Consortium and Oregon State University. Looking ahead, Robin sees far-reaching opportunities for point-supported systems as climate conscious framing within mid-to-high-rise multi-family residential structures. Robin's approach to mass timber design invites creativity and collaboration across AEC trades. She works with teams to minimize a project's impact on the built environment and celebrate structural materiality. Robin finds it incredibly rewarding to deliver completed mass timber solutions to communities most in need: it's all about creating spaces that people thrive in.

- COLLAPSE

10:30 AM – 12:00 PM

They Hold the Keys: How To Successfully Negotiate and Interact With Building Officials

D Meeting Rooms: 135–136

TRACK 2

Moderator:

Tanya Luthi · Vice President · Entuitive

Tanya Luthi is a structural engineer and Vice President at Entuitive, an international consulting engineering practice. Tanya started her engineering career in New York City specializing in large-scale institutional projects. After moving to Vancouver in 2011, she discovered a love for mass timber design and has made it a focus in her career. She is a member of the New York City structural code committee and serves on the Board of Directors of WoodWorks.

Presentations:

Coordinating Mass Timber Projects with Fire Marshals

Mass timber projects require a unique approach to design, construction and approvals. In this session, hear first-hand from a fire marshal with mass timber experience what fire marshals look for in new building designs and plans, what some of the common challenges tend to be, how architects and engineers can provide information at the outset to address some of these items, and what types of collaboration and coordination should be expected between design team and fire marshal on mass timber projects.

John Walser · Deputy Chief · Fairfax County Fire and Rescue Department

John Walser is a Deputy Chief in the Fairfax County Fire and Rescue Department and currently works in the Office of the Fire Marshal. He has been in the fire service for over 30 years. In his role, he is responsible for the oversight of Life Safety Inspections, Engineering Plans Review, Fire Protection Systems, and Fire Investigations. He holds a Bachelor of Science degree in Mechanical Engineering from Lehigh University, and a Master of Science Degree in Fire Protection Engineering from Worcester Polytechnic Institute. He is a principal member of the technical committee for Fire Risk Assessment Methods and was a member of the ICC Ad Hoc Committee on Tall Wood Buildings. He lives in Centreville, Virginia, with his wife Kate and daughters, Abby and Suzanna.

Mass Timber Buildings: Make it Easy to Approve

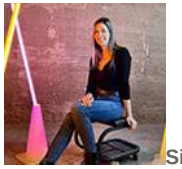
We all want mass timber buildings to be permitted efficiently, to reduce risk, cost and stress, for everyone involved. Codes and standards are complicated and when building with mass timber, this can add another layer of difficulty, given each building is always unique. Authorities having jurisdiction have an important role to perform and a project team needs to work cooperatively with the AHJ team. We all want to get along and everyone wants to reach a positive resolution, as we all have a job to do. An important methodology for mass timber construction is to design a building that is easy to approve. It is the responsibility of the project team to communicate and document a design that works with the code, follows guidance on variances and alternatives, responds to early-stage feedback, and gets approved. This brief presentation provides an overview of what a successful mass timber project should look like, and what to avoid, based on project case studies and lessons learnt.

David Barber · Principal · Arup

David is a Principal with Arup, specializing in the fire safe design and approval of mass timber buildings. For over 25 years David has assisted clients with compliance fire testing, developing new timber technologies, authoring design guides, assisting with codes and standards and completing engineering design solutions for mid-rise and high-rise timber buildings. David leads a global team that works with developers, architects and researchers to enable mass timber structures. David's mass timber experience is international, having delivered projects in eleven countries.

Getting Them on Your Team

Over several projects we have worked to include our building officials instead of excluding them. We know that they will be reviewing the documentation at some point, and they also want to be a part of positive change. A good example would be currently working with our local building department to adopt 2021 IBC, regardless if the State of Michigan does by the time we would be ready to break ground on a new mass timber project.



Sidney Filippis · Studio Director / Architect · Synecdoche

As a licensed architect, Sidney has the opportunity to actualize clients goals, working closely with them from the initial idea to the opening day. Delivering a space that exceeds their expectations brings her so much joy. Working on projects as small as furniture design and as large as 1 million square feet, Sidney is comfortable diving in to the fine details and simultaneously zooming out to the big picture. She believes architecture is more than the building shown on the drawings her company produces: it is also the branding, the furniture, the graphics, and the social impact. Within her work and personal life, Sidney values teamwork, and is motivated to bring the best people together. She loves learning new things especially on project types that she has never worked on before. Sidney is always open for a conversation about how architects can bring value to your life.

Mass Timber in Wisconsin: Thinking Bigger

Building codes control safety and evolve to allow for emerging materials and technology. Lagging codes can make innovation more challenging. Wisconsin recognizes the economic and environmental benefit of mass timber construction and wants to make sure that the commercial building code supports progress while maintaining safety. The result is a set of performance-based guidelines to help designers and owners replicate or expand current mass timber applications in Wisconsin.

Jennifer Garrett · Assistant Deputy Secretary · Wisconsin Department of Safety and Professional Services

Jennifer Garrett is the assistant deputy secretary of the Wisconsin department that regulates the construction industry and promulgates the state building codes. She is responsible for external relations, including media, legislative, professional board, and stakeholder engagement. She helps establish agency policy initiatives and advances those through outreach, communication, and collaboration. Through her leadership, Wisconsin has developed a set of mass timber guidelines to help designers navigate the variance process with the end goal of facilitating mass timber adoption in the state. This work also influenced Governor Tony Evers' Clean Energy Plan, which called for the establishment of an advisory council on building sustainability. The Wisconsin Advisory Council on Building Sustainability will advise state code councils on opportunities to enhance community resilience, encourage innovation, and incentivize use of clean energy in residential and commercial construction. Originally from Indiana, Jennifer has a bachelor's degree in English from Purdue University and she earned her J.D. at Indiana University-Bloomington.

- COLLAPSE

10:30 AM – 12:00 PM

Ensuring Sustainable Long-Term Growth in the Materials Industry

E Meeting Rooms: 141–144

TRACK 3

Sponsored by ***Nordic Structures***

Moderator:

Helena Murray · Wood & Biomass Utilization Specialist · US Forest Service

Helena works for the US Forest Service, Pacific Southwest Region as a wood and biomass utilization specialist. She collaborates with partners on initiatives to improve markets for wood and biomass that can support forest ecosystem restoration across California, Hawaii and the US Affiliated Pacific Islands. Helena has a specific interest in how a robust wood products supply chain contributes to forest, community, and economic resilience. Helena has a Bachelor of Science in Forestry from University of Vermont and a Master of Science in Environmental Conservation from UMass Amherst.

Presentations:

Sustainability Due Diligence for Mass Timber Projects

Architects, developers, and building owner/occupants are increasingly taking sustainability considerations into account when deciding which building materials to use. Roy's presentation will focus on key sustainability metrics to consider as part of due diligence in a assessing a building project's sustainability in the context of mass timber. For example, the ability of forests to sustain timber production and the ability of the sawmill industry to produce lumber to meet the demand created by mass timber building construction. Attendees of this session will gain a better understanding of the current and projected scale of the mass timber building industry relative to the capacity of North America's forests and sawmilling industry to provide the needed materials.

Roy Anderson · Vice President · The Beck Group

Roy has more than 30 years of forestry and forest products manufacturing industry experience. As Vice President at The Beck Group, a forest products planning and consulting firm based in Portland, Oregon, he has worked with clients to assess: the feasibility of mass timber manufacturing, mass timber market size, and glulam lumber supply and manufacturing feasibility. He has also been a speaker at past International Mass Timber Conferences in 2016 and 2022.

Delivering Sustainability at Scale, From the Forest to Manufacturing to the Market

How does sustainability in the forest translate to the acceptance of a mass timber as a sustainable building material? How do manufacturing efficiencies and improvements in lumber mills and engineered wood products facilities translate to the mass timber market? What opportunities do we have to connect the sustainability-related dots between the forest and mass timber buildings? This presentation will introduce a simple framework to consider the connection between sustainable

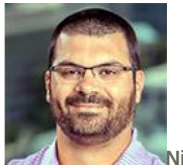
forestry, sustainable manufacturing and sustainable buildings, leaving us with a path forward to make informed, effective decisions about sustainable material choices in this complex and fascinating supply chain.

Ara Erickson · Vice President, Corporate Sustainability · Weyerhaeuser

Ara Erickson is Vice-President of Corporate Sustainability at Weyerhaeuser, where she is accountable for the development and implementation of the company's comprehensive sustainability strategy, including three areas where the company is in a unique position to participate: working forests contribution to climate change solutions, the role of sustainable products in ensuring housing for everyone, and support for thriving rural communities. She serves as a board member for American Forests, the oldest national nonprofit conservation organization in the United States, is a founding steering committee member for the Women's Forest Congress, and uses her voice to be an advocate for sustainable, working forests. Ara is an authentic, compassionate, and driven leader, best known for building partnerships through collaboration, transparency and honest communication. Prior to Weyerhaeuser, she served as Director of the Green City Partnerships program with a regional conservation organization and as a forest-based researcher, environmental consultant and educator. She received her M.S. in Forest Resources from the University of Washington and her B.S. in Resource Management from the University of California, Berkeley.

Mass Timber and the Long-term Sustainability of Forestry in Georgia

Georgia loses 118,000 acres of timberland annually to conversion, primarily development. Increased adoption of mass timber in Georgia and the Southeast can help avoid future conversion of timberlands and ensure the long-term sustainability of working forests in Georgia. As the #1 forestry state in the country, there is a huge opportunity for mass timber in Georgia and across the southeast. From landowners to loggers, mills to developers, mass timber has the potential to ensure the long-term strength, sustainability, and growth of the forestry industry in Georgia. This presentation will discuss how mass timber can provide sustainable long-term growth in the forestry industry in Georgia and across the southeast while highlighting the 619 Ponce building, the first locally-grown mass timber building currently under construction in Atlanta, Georgia.



Nick DiLuzio · Vice President · Georgia Forestry Foundation

Nick DiLuzio is the Vice President of the Georgia Forestry Foundation. In this role, he is responsible for overseeing the operations and programs of the Foundation, which is focused on ensuring the longevity of Georgia's 22 million acres of working forests by maximizing Georgia's working forests as a solution to our nation's greatest challenges. Nick's role includes overseeing the Foundation's three programmatic areas (Education and Leadership, Environmental Sustainability, and Economic Competitiveness), leading the Foundation's fundraising and development efforts, and engaging with stakeholders and partners across the state and the country. Nick received a Bachelors of Science in Biology from Davidson College and Masters degrees in Forestry and Environmental Management from the Nicholas School of the Environment at Duke University. He is also a Certified Forester and holds a Certificate in Geospatial Analysis from Duke University.

- COLLAPSE

10:30 AM – 12:00 PM

'It Depends' Isn't Cutting It: Establishing Translatable Cost Parameters for Mass Timber Construction

E Meeting Rooms: 145–146

TRACK 4

*Sponsored by **TallWood Design Institute***

Moderator:

Rose Braden · President · Softwood Export Council

Rose Braden is the President of the Softwood Export Council (SEC), a non-profit trade association made up of U.S. forest products associations, state trade agencies, and public research centers who work together to increase the use of U.S. softwood products globally. She has over 20 years of experience developing international marketing strategies for the U.S. forest products and building materials industries and executing promotional programs. For ten years Braden directed international marketing and educational programs as the President of the Evergreen Building Products Association. Prior to her work with the EBPA, she was an analyst for the Center for International Trade in Forest Products at the University of Washington where her work included projects on Taiwan, China, Japan, Europe, and U.S. industry trends and manufacturing clusters.

Presentations:

A Systems-Based Approach to Mass Timber Multi-Family Housing

oWOW is a vertically integrated company whose mission is to build homes that people love at prices they can afford. Mass timber is an integral part of our approach to reducing construction timelines and costs in order to make housing more affordable. In this presentation we will review a number of the strategies we employ to make our projects more affordable, including:

- Using a unique point-supported structural system that reduces the overall number and size of components. It is incredibly materially efficient and incredibly fast to erect.

- Optimizing our structural layouts around the raw dimensions of our mass timber floor panels to reduce cutting and material waste.
- Using factory-built, prefabricated components wherever possible to reduce site labor costs and construction time. We use standardized systems and prefabrication for unitized facade systems, lateral systems and pre-engineered mass timber components.
- Using the same standard kit of parts across multiple projects. This reduces design and engineering time, cost and complexity, streamlines materials procurement and supply chain management, and helps us achieve consistent, high-quality construction across projects. We can then pass off these savings on to our customers in the form of reduced rents for a high quality product.

Andy Ball · President · oWOW

Andrew Ball is the President of oWOW, an Oakland, Cal. firm specializing in Real Estate Development services, with vertically integrated Project Design, Construction and Property Management Divisions. He was previously President and Partner at RAD Urban, a company specializing in high rise Modular housing projects with internal divisions providing Manufacturing, Design, and Construction. Prior leadership positions include President of Suffolk Construction West Region and President and CEO of Webcor Builders; both companies provided General Contracting services for Residential, Commercial, Hospitality, and High Technology Projects. Mr. Ball was a four time Governor appointed California Water Commissioner, a Board member of the Bay Area Council, and co-Chair of its Water Committee, and served as a Board member of the Silicon Valley Leadership Group heading up Water Policy. He has been involved in other industry organizations including the San Francisco Chamber of Commerce, the San Francisco Center for Economic Development, SPUR, Stanford Center for Integrated Facility Engineering, and UC Berkeley's Center for the Built Environment.

The Magic of Mass Timber in Public Projects: Working With Public Agencies To Establish Translatable Solutions That Are Economically Responsive, Locally Appropriate, and Sustainable Using Mass Timber

With 22 Mass Timber projects in design and completion, FFA has found success while navigating the complexities of public project types where budgets are fixed, in a process governed by a reluctance to seek unfamiliar methods and building materials**.** We'll illustrate cost/budget tradeoffs to work with the owner early in the design process using a systems-analysis that demonstrates the pros and cons of different building construction systems, decision process, and cost savings results.

We can demonstrate how we used mass timber to provide customized solutions in a variety of projects utilizing CLT, Glulam, MPP, and hybrid systems from higher education to public safety and to other small and large civic building types within urban and rural areas.

Ian Gelbrich · Partner · FFA Architecture and Interiors

Ian's 22-year career as a project architect, designer, and manager spans across many project types and scales, including civic, commercial, institutional, higher education, retail, entertainment, and housing. Early in his career, he developed an affinity for civic projects and the positive impact they have on communities. He applies his capabilities in conceptual and technical design to help clients dream big and create architecture that lasts. As the leader of FFA's civic architecture market, Ian adds a rich layer of public outreach experience and dedication to designs rooted in their communities.

Putting Numbers to "It Depends"

With a decade of projects numbering over 1,500 in the US, and a growing community of designers and builders with multiple completed projects, are cost trends emerging? If we zoomed out from the many details that make a mass timber project successful, and just examined the numbers, would a pattern emerge? To investigate these questions, architects, engineers, and builders with a depth of experience with mass timber projects shared statistics from their portfolios. This presentation elaborates on where project cost successes and struggles occur by breaking buildings into three macro systems to explore the advantages, challenges, and potential in each.

Emily Dawson · Architecture | Mass Timber | Prefabrication · Single Widget

Emily implements mass-timber solutions, seeing projects through from feasibility to construction. In 2013, she designed the first cross laminated timber structure built in Oregon. Inspired by her studies of European mass-timber and prefabrication applications, Emily increasingly applies off-site fabrication approaches in her work. She is driven by a commitment to transforming the way we build toward a truly circular construction economy. Her portfolio of sustainably-focused projects spans 20 years. She received her degree in architecture from Cornell University.

- COLLAPSE

12:00 PM – 1:15 PM

Break and Exhibitor Appreciation

Exhibit Halls C, D, E

GENERAL

+ VIEW DETAILS

1:15 PM – 2:45 PM

Common Architectural Design Challenges With Mass Timber in Multi-Family Projects

D Meeting Rooms: 137–140

TRACK 1

*Sponsored by **Sansin***

Moderator:

Kate Carrigg · Regional Director – Oregon, Idaho-South, Hawaii · WoodWorks – Wood Products Council

Kate came to WoodWorks with a decade of construction industry experience in the Pacific Northwest. She holds a dual M.S. degree in Civil Engineering and Wood Science from Oregon State University with a focus in structural engineering. As a licensed Professional Engineer in Oregon and California, she was involved with the design of mass timber projects during the early stages of code development for CLT. In addition to engineering, she has field experience working as a project engineer for a general contractor and has been involved in both the design and construction of multifamily podium buildings. Kate's diverse background allows her to approach projects and problem solving holistically, with constructability and non-structural building systems in mind.

Presentations:

Acoustic Flanking Demystified: New Testing Findings

Acoustic isolation is a fundamental challenge for mass timber construction, and solutions that work in the built-environment are critical for the success of the industry. While acoustic laboratory test data is readily available for a wide range of mass timber assemblies, field test data and flanking paths data is rare. This talk presents the findings from two recent projects where acoustic field data has been collected, including a modular mass timber prototype utilizing all dry trades, and a full-size mock-up that tested multiple variables, including the flanking path through continuous ceiling CLT panels spanning residential units.

The presentation will provide "watch-its" for mass timber projects, and effective solutions to address problematic flanking paths**.** The topic will also cover "best practice" for identifying and addressing inter-disciplinary design issues early in design.

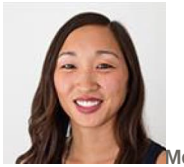
Denis Blount · Acoustic Consultant | Associate Principal · Arup

Denis Blount is an Associate Principal and leads the Acoustic, Audiovisual and Theater Consulting team in Arup's Seattle office. Denis is a leading advocate for mass timber research and construction. He has presented at numerous conferences on the topic and is currently active with the AIA-Seattle Mass Timber Working Group. Denis believes that a shift to building with more renewable resources, such as wood, is an essential shift in the construction industry to help reduce our carbon footprint in the world.

Minding the Gap: How to Really Make Mass Timber Housing Pencil

In high-density multifamily housing, the critical design question has always been: can we close the cost gap between concrete and mass timber construction types? If so, then mass timber's path as the future of housing is clear. However, the answer is unproven and particularly challenging in affordable housing, where wood aesthetics cannot compensate with higher rents.

This presentation will outline the paths forged toward a solution to making mass timber pencil against concrete and steel systems in two Type IV-B housing projects. The first is an 8-story, mixed-use, affordable housing building in Santa Cruz, Cal. In this project, the design and contractor teams developed and priced an exhaustive set of structural options for the building to show that a point-supported timber system would best compete with Type I construction. A study of the lateral options reduced material costs further. Refinement of the point-supported system, including column sizing, structural-fire analysis of the connections, and diaphragm detailing was also required. Lastly, test results on the point supported system needed to be incorporated into the design. Lessons learned from this project were optimized in the second project that will be highlighted in this presentation — an 11-story market-rate housing building in Portland, Ore.



Megan Stringer · Associate Principal · Holmes

Megan Stringer is an Associate Principal with Holmes. Motivated by our impact on the built environment, Megan is at the forefront of reducing structural embodied carbon. Megan has overseen North America's largest mass timber project at the Microsoft Silicon Valley Campus, utilized low-carbon concrete pours at Intuit, and performed many life cycle assessments. She also serves as President of the Structural Engineers Association of Northern California.

Joe Swain · Senior Associate, Architect · Mithun

Joe Swain is a Senior Associate and architect with Mithun. He specializes in modular and prefabricated systems, and has worked with mass timber for over eight years, from schools and offices to large-scale multifamily residential projects. He has worked on ICC Tall Wood code-related research, including most recently a pair of CLT exterior-wall fire tests, and he studies the relationship between carbon in mass timber and forest management as a member of the SDL Climate-Smart Wood Group.

Utilizing DLT Components in Vertical Mixed Use: A Case Study

The Garden District, which will be the tallest DLT mass timber residential structure in North America when complete, serves as a valuable case study for understanding the marketability of mass timber in the rental apartment space. The project is the first phase of an extensive 19 acre redevelopment located in Woodinville, Washington, and applied for building permit in September 2022.

With cost as a critical driver, there are several key challenges we would like to share:

- Acoustic assembly development: The team engaged in extensive 3rd party testing to achieve satisfactory acoustic values for the DLT residential floor system. The team calibrated the floor assemblies to utilize cost effective topping and finish systems that reduce labor and schedule impacts.
- Structural iterations: several structural iterations, including various combinations of bearing walls, post/beam and other hybrid configurations were explored. Computational design tools assisted the team in arriving at solutions.
- Fire ratings: DLT fire ratings were modified to be comparable to concrete assemblies.

The Garden District represents a scalable, repeatable housing paradigm that will offer key takeaways for other teams who engage in this project type.

Ted Panton · Principal · GGLO

As a Principal at GGLO, Ted is proficient at planning vertical mixed use programs in urban settings and has strong working relationships with a variety of local and national clients. His work as an Architect in this setting has made him a strong advocate of design solutions centered on livability and urbanism. He has championed the use of wood technology across a spectrum of infill housing typologies, including the integration of heavy timber and mass timber components. He developed a hybrid cross laminated timber multi-dwelling module that is being used in several projects and that has been presented in workshops and conferences across the US including the International Mass Timber Conference. Recent efforts include the Cadence 21 Multifamily development in Seattle, Wash (building permit received in 2021), and the Garden District Phase 1 DLT mixed use structure, submitted for building permit application in September 2022.

- COLLAPSE

1:15 PM – 2:45 PM

Lessons Regarding Post-Occupancy Performance of Mass Timber

D Meeting Rooms: 135–136

TRACK 2

Moderator:

Craig Curtis · Director of Emerging Building Technologies · Mithun

Craig is a nationally recognized design leader with a focus on innovative, sustainable integrated design and the incorporation of emerging building technologies including mass timber and modular construction. He has extensive experience with mass timber projects including several projects currently in design at Mithun, including an 11-story mass timber condominium project, multiple buildings for the Binderholz company and commercial office structures. Craig also serves in a firmwide role, sharing knowledge across the practice and collaborating with teams on a wide range of project typologies for clients looking to explore the integration of new building technologies. He is a frequent presenter at conferences, design awards juror and architectural studio critic, supporting the advancement of mass timber and development of next generation talent. Craig spent five years at Katerra prior to joining Mithun, where he led the architecture and design division and was responsible for the development of several building platforms utilizing mass timber as the basis for design. While at Katerra, Craig was architect of record for the Catalyst building (designed to ILFI zero energy and zero carbon certification standards), and the development of the Katerra CLT factory in Spokane Valley, WA (now owned and operated by Mercer, Inc.).

Presentations:

Facts and Feelings: Comparing Post Occupancy Results with Initial Project Expectations

Convincing public agencies to choose mass timber over traditional materials requires the design team to clearly communicate cost, performance, and user experience. KPFF and FFA Architecture and Interiors have utilized mass timber on several public buildings on which we have also collected user experience data. We will share the design and construction considerations for each project and the outcome from the data collection and survey results, comparing the original project expectations with the post-occupancy results. Survey information includes floor vibrations, acoustics, aesthetics, control

of moisture during construction, cost, schedule, and user experience. We hope this information and presentation are useful for communicating with building owners and clients about their concerns relating to adoption of mass timber. Let us share with you what we learned on this data collection journey.

Edward Running · Associate Partner · FFA Architecture and Interiors Inc.

Edward is an architect and designer with 23 years of experience in higher education, corporate, public, and residential projects. He helps clients create innovative places that serve with lasting character and durability. Passionate about designing sustainable, universally welcoming environments where academic and community partners can thrive, Edwards's visionary approach guides project teams through a truly collaborative design process.

Katie Ritenour · Associate · KPFF Consulting Engineers

Katie is a licensed structural engineer with over 15 years of experience. She has worked with a wide range of materials and produced an array of successful systems. She is invested in meeting each project's goals, aesthetic vision, and technical needs. Katie is passionate about designing mass timber buildings and has presented on mass timber structural systems across the country to clients and industry groups. She thrives on the collaborative process mass timber design requires.

Wood Protection: Planning for Post Occupancy

Specifying a coating system for interior and exterior mass timber surfaces is developed during a deliberative process to consider aesthetic preferences and wood protection needs during and post-construction. However, the decision on the optimal coating system goes well beyond the first few weeks of occupancy. Considerations related to design, exterior weathering exposure, coupled with interior use, cleaning methods, human contact and repairability are all factored to ensure surfaces can be maintained easily and successfully for the long term. Caroline March-Long will discuss how to build a maintainable coating system — and strategies to create a proactive maintenance plan.

Caroline March-Long · Director Architectural Finishes and Commercial Coatings · Sansin

Caroline directs the development and support of retail, architectural and OEM customers across North America, Europe and the rest of the world looking for high-performance, water-borne wood finishes for both residential and commercial projects. Caroline has presented at the Mass Timber conference, AIA CPD meetings and other Wood Works events over the years related to best practices for Mass Timber protection and beautification, and spearheads Sansin's architectural specification and after care maintenance programs for mass timber.

Weathering Wood: Achieving Long Term Durability and Maintenance of Exterior Architectural Mass Timber

Experience of mass timber is often reserved to the interior of a building or what is visible through exterior glazing. Did you ever wonder about the practicality of exposing part of the frame on the exterior? Could it last for 50 years or more exposed to precipitation and sunlight? How will it look after decades of exposure? Join us for a deep dive into the opportunities and challenges of exposing mass timber to the elements. The presentation is designed to give an engineering, architectural and builders perspective covering a wide range of topics including code, standards, species, preservative treatments, finishes, research, detail and specification considerations. Featured examples of longevity will show what you can expect over decades of exposure. All to help you make decisions that minimize maintenance and maximize mass timber's beauty over the long term.

Hans-Erik Blomgren · Senior Engineering Manager · Timberlab

Hans-Erik is Senior Engineering Manager at Timberlab providing technical design services for mass timber building projects. Timberlab is a Portland, Oregon-based mass timber contractor that provides sourcing, design, fabrication, and install services on building projects across the United States. During his career, Hans-Erik has worked as a structural engineer consultant on many large scale commercial building projects and also in manufacturing as a cross-laminated timber product development manager. Hans-Erik currently represents Timberlab on the American Wood Council Wood Design Standards code development committee.

Scott Barton-Smith · Preconstruction Manager · Timberlab

Scott is a registered architect in the State of Oregon with three decades of experience. He designed his first timber structure in 1997 and has served as architect, design lead, or mass timber expert on ten more. Scott's project experience is augmented with research in mass timber sustainability, acoustics, sourcing, connections, and housing. As Preconstruction Manager for Timberlab, he works directly with clients and design teams to disseminate information on the use of mass timber as a more sustainable alternative while providing project-specific assistance to support appropriate and optimal design.

- COLLAPSE

1:15 PM – 2:45 PM

Understanding the Impacts of Material Choices through Carbon Accounting

E Meeting Rooms: 141–144

TRACK 3

*Sponsored by **Nordic Structures***

Moderator:

WoodWorks

Presentations:

Understanding What Makes Wood Different: A Deep Dive into Biogenic Carbon Accounting

Growing interest in wood products as a tool to reduce the embodied carbon footprint of the built environment means wood products are often compared to more traditional building materials. However, wood is unique from these other materials because it is a bio-based material with carbon storage benefits. The treatment of this stored, biogenic carbon is often a point of confusion for building designers and stakeholders due to lack of standardization within life cycle assessment (LCA) tools and inadequate guidance on proper accounting methods. This presentation will explain life cycle biogenic carbon accounting as outlined in the international standard ISO 21930, identify ways LCA tools align with or deviate from this standard, and address the biogenic carbon data presented in typical environmental product declarations.

Ashley Cagle · Technical Director · WoodWorks

Ashley is a licensed professional and structural engineer in the state of California, having worked as a structural consultant in both the San Francisco Bay Area and Spokane, Washington with an expertise in light wood-frame construction. In addition to providing technical support on a variety of light wood-frame and mass timber projects around the country, she leads WoodWorks' efforts to educate architects and engineers on using life cycle assessment as a tool to measure the embodied carbon impact of wood products and buildings. Throughout her career, Ashley has been involved in various professional and code-development committees. She received a Bachelor of Science from Cornell University and a Master of Science from The University of Illinois at Urbana-Champaign.

Tracking Carbon Though Design: From Early-Stage Carbon Accounting to Whole Building Life Cycle Assessment

With lower manufacturing energy demands and the added benefit of biogenic carbon storage, wood products are a proven solution for reducing the overall carbon impact of buildings. However, as structural engineers take the lead on embodied carbon reduction efforts, questions arise about how to accurately assess the benefits of wood compared to other structural materials. This presentation will address both early-stage carbon accounting used during conceptual design and Whole Building Life Cycle Assessment (WBLCA). The results of comparative carbon assessments performed on real mass timber buildings — along with their steel and concrete alternatives — will reveal the differences in global warming potential, illustrating the opportunity for use of mass timber as an embodied carbon reduction strategy.

Alexis Feitel · Structural Engineer, Team Carbon Unit Director · KL&A Engineers & Builders

Alexis is a licensed structural engineer with nearly 10 years of experience in custom high-end residential, high seismic residential, multi-family, concrete high rise, existing building renovation, construction engineering, material salvage, and sustainable design experience. She is the KL&A Team Carbon Unit Director, a team of inhouse expertise focused on embodied carbon quantification, reduction strategies, and implementation into the current design and (de)construction practice at KL&A.

- COLLAPSE

1:15 PM – 2:45 PM

Cost and Value: How Developers Think About and Analyze the Economics of a Mass Timber Building

E Meeting Rooms: 145–146

TRACK 4

*Sponsored by **TallWood Design Institute***

Moderator:

Melissa Kroskey · Technical Director · WoodWorks

Presentations:

Presentations announced soon.